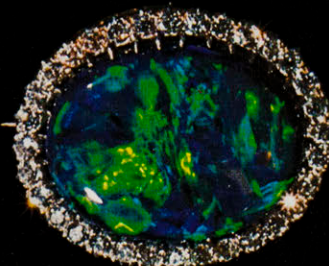
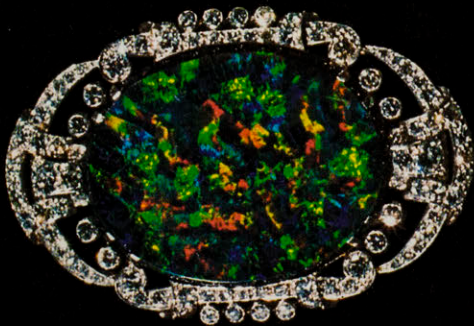
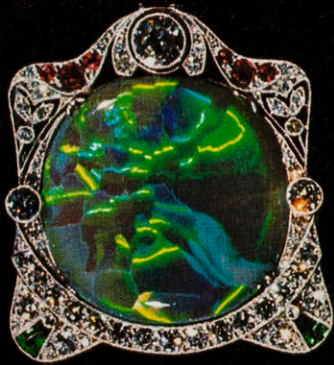




MUSEUM
ALLIANCE

QUARTERLY

LOS ANGELES
COUNTY MUSEUM
OF NATURAL HISTORY
VOL. 5 NO. 4
SPRING ISSUE 1967





A message from the chairman

by

Douglas J. Macdonald

Membership in the Museum Alliance rose from 5,827 on the 30th of April, 1966 to 6284 on 31st of March, 1967. During this period income from membership dues rose accordingly and enabled the Museum Alliance to increase its financial support of Museum programs in all divisions, to assist in the purchase of several items for display, and to provide the major support for the publication of the interim catalog of the new Hall of Pre-Columbian Archeology.

The following members of the Museum Alliance served on the Membership Committee: Henry Clifford, Hugh W. Darling, Ed Harbach, Ruth LeSage, Margie Peterson, Nancy York. All served with distinction, originating new ideas and working for their implementation.

It is particularly rewarding to see the steady increase in membership as only through large memberships can the Museum Alliance fulfill its mission. To this end, the Second Annual Membership drive was inaugurated, running from February 15, 1967 to May 15, 1967. Important prizes were offered to stimulate the widest possible interest and participation on the part of the entire membership. Final results will not be available before this issue of the Quarterly goes to press, but will be announced in the Calendar and a future Quarterly shortly after winners have been determined.

It is of vital importance that every current member of the Alliance not only continue to maintain his own membership but to be constantly prepared to recruit new members. Since this recruitment assignment will only be acceptable to a satisfied membership, all other committees of the Board of Directors strive to make the

Alliance more enjoyable and meaningful for all members and their families, thus providing a sound basis from which the Membership Committee can function.

We hope that you and members of your families have visited the Museum many times during the past year to see the progress that you have helped to make possible, and have participated in the various programs offered by the Alliance.

5th Annual Meeting



The Annual Meeting on May 15 was held in the Main Foyer of the Museum with Dr. Lynn White, Jr. as the guest speaker. Dr. White's theme "Arms and Armor in the Middle Ages" proved of great interest to the audience and was particularly apropos of our Hall of Arms and Armor this coming fall.

Dr. White is Professor of History at University of California, Los Angeles, and Director of Center for Medieval and Renaissance Studies. He was formerly President of Mills College.

In addition to the usual order of business including committee reports, and the allocation of discretionary funds to the Museum, awards were bestowed by the Museum Division heads to volunteer workers for outstanding service to the Museum.

The meeting was under the Chairmanship of Mrs. John E. Mack. Hostesses for the occasion were ladies of the Alliance Board and the Docent Roundtable who perform many valuable services for the Museum.

Brief guided Flying Carpet Tours were available after the meeting for those who could stay.

Join the Museum Alliance

There is something in it for everyone! You are invited to become a member of the Los Angeles County Museum Alliance, to participate in its programs, to receive its publications, and announcements.

Membership privileges and pleasures include:

1. Subscription to the Alliance QUARTERLY
2. The monthly CALENDAR OF EVENTS
3. Family participation programs—NEW DIMENSIONS TO DELIGHT—tickets available only to members
4. 20% discount on most items at the Museum Bookshop
5. Invitations to previews and receptions for new exhibitions and to meet lecturers
6. Discount on lecture tickets
7. Additional selected publications
8. An ever expanding program of benefits for children

Memberships are available in the following categories:

- ☐ Active
 - ☐ Contributing
 - ☐ Supporting
 - ☐ Sustaining
 - ☐ Life
- \$10.00 annually
\$1000.00 single payment
\$25.00 annually
\$50.00 annually
\$100.00 annually

Make checks payable to:

MUSEUM ALLIANCE
900 Exposition Boulevard
Los Angeles, California 90007

**Los Angeles
County Museum
of Natural History**

HERBERT FRIEDMANN

Director

CHARLES F. GEHRING

Assistant Director

THEODORE DOWNS

Chief Curator, Earth Sciences

FRED S. TRUXAL

Chief Curator, Life Sciences

RUTH I. MAHOOD

Chief Curator, History

RUSSELL J. SMITH

Chief of Education

Museum Alliance

Board of Directors

DOUGLAS J. MACDONALD

Chairman

ROY E. MARQUARDT

1st Vice Chairman

MRS. E. HADLEY STUART, JR.

2nd Vice Chairman

F. THOMAS FREEAR

3rd Vice Chairman

MRS. EDWARD LILLY, JR.

Secretary

THOMAS WOLFE

Immediate Past Chairman

C. V. DUFF

Treasurer, Museum Foundation

HENRY H. CLIFFORD

HUGH DARLING

MRS. JUSTIN DART

CARL S. DENTZEL

L. M. DONAHUE

WILLIAM W. DREWRY, JR.

MRS. ROBERT H. EDWARDS

MRS. EVERETT G. HAGER

MRS. WYNN HAMMER

EDWIN HARBACH

GLENN HIATT

LAUDER W. HODGES

LAWRENCE JEFFRIES

MRS. JAMES F. LESAGE

MRS. JOHN MACK

SHELDON H. MARKS

DR. H. EARL PEMBERTON

MRS. WALTER E. PETERSON

ROBERT E. PHILLIPS

CHARLES S. SCHWARTZ

MRS. EWING SELIGMAN

H. CARL TENSFELDT

ROBERT A. WEINSTEIN

MRS. CARL M. YORK, JR.

HERBERT YOUNG

Honorary Members

MRS. BRUCE BELT

MR. JOHN CHADWICK

DR. P. T. FURST

CHAUNCEY HAMLIN, JR.

ED N. HARRISON

MRS. PRESTON HOTCHKIS

KENNETH HULL

MRS. LAWRENCE E. IRELL

DR. GEORGE C. KENNEDY

D. RODNEY LEE

J. ERIC MACK

CHARLES O. MATCHAM

HARRY J. PACK

A. RABORN PHILLIPS, JR.

Ex-Officio

DR. HERBERT FRIEDMANN

Museum Director

MRS. JOHN CLAYTON

Docents

MRS. FRANCES KELLOUGH

Administrative Secretary



QUARTERLY

LOS ANGELES COUNTY MUSEUM
OF NATURAL HISTORY
VOL. 5, NO. 4 SPRING ISSUE 1967

Opal, The Royal Gem **4**

San Pedro Bound with Lumber from
the Mendocino "Dogholes" **6**

Community Dolphin Life **12**

A Return to the Worselands **16**

Mdudu wa Uhuru **21**

Our Avian Kaleidoscope **22**

The Aardwolf: The Hyaena that isn't **26**

Museum Bookstore **30**

Spotlight **31**

LOS ANGELES COUNTY MUSEUM OF NATURAL HISTORY BOARD OF GOVERNORS

MR. WILLIAM T. SESNON, JR.

President

MR. ED N. HARRISON

1st Vice President

DR. JOSEPH B. KOEPFLI

2nd Vice President

MR. WILLIAM J. SHEFFLER

Secretary

MR. ED AINSWORTH

MR. DAVID W. HEARST

MRS. E. HADLEY

DR. RICHARD CALL

MR. BART LYTTON

STUART, JR.

MR. C. V. DUFF

MR. MAURICE A. MACHRIS

DR. NORMAN TOPPING

MR. JOHN JEWETT

MR. CHARLES O. MATCHAM

DR. M. NORVEL YOUNG

GARLAND

LOS ANGELES COUNTY MUSEUM OF NATURAL HISTORY FOUNDATION

DR. JOSEPH B. KOEPFLI

President

DR. M. NORVEL YOUNG

Vice President

MRS. E. HADLEY STUART, JR.

Secretary

DR. RICHARD CALL

Treasurer

MR. C. F. GEHRING

Assistant Treasurer

MR. ED AINSWORTH

MR. DAVID W. HEARST

MR. CHARLES O. MATCHAM

MR. C. V. DUFF

MR. BART LYTTON

MR. WILLIAM T. SESNON, JR.

MR. JOHN JEWETT

MR. DOUGLAS J. MACDONALD

MR. WILLIAM J. SHEFFLER

GARLAND

MR. MAURICE A. MACHRIS

DR. NORMAN TOPPING

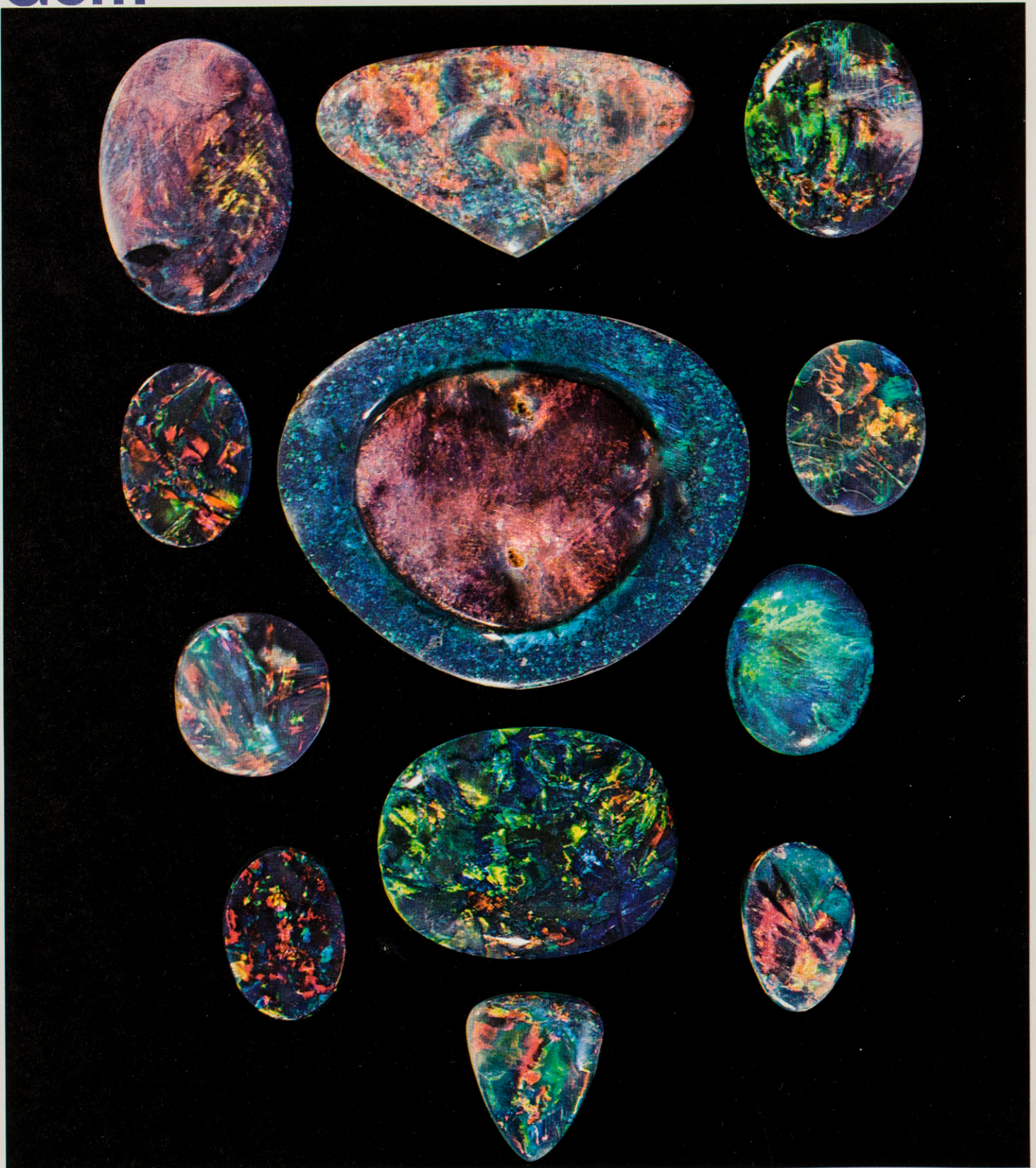
MR. ED N. HARRISON

MR. ROY E. MARQUARDT

The Los Angeles County Museum of Natural History QUARTERLY is published for the MUSEUM ALLIANCE. Dorothy H. Seligman / Editor: Harry Pack, Frank Page / Art Editors: Armando Solis / Museum Photographer: Mary Butler / Museum Illustrator. QUARTERLY Committee / Theodore Downs, Herbert Friedmann, Glenn Hiatt, Ruth I. Mahood, Gretchen Sibley, Richard Lipscomb, Fred S. Truxal, Robert Weinstein.

Opal, the Royal Gem

by Richard H. Merriam
Acting Curator of Geology-Mineralogy
and
Barbara V. Lowe
Preparator



Pliny wrote, "The opal is made up of the glories of the most precious gems which places it beyond description."

Those who saw the Museum's exhibit of the world famous Kelsey I. Newman Collection of Australian black opals must agree with Pliny. Few of nature's displays of color can equal the beauty of precious opal.

Opal was first known to the Romans who probably obtained some from Hungary. They held it in great esteem, as Pliny's quote would indicate. One incident tells of Nonius, a Roman senator, who was forced to flee from Rome because Marc Antony coveted an opal which he owned and refused to sell.

Apparently the superstitions concerning opal began sometimes during the Middle Ages when plagues were rampant through Europe. When the plague ravaged Venice, the opal happened to be of great popularity. As opal is affected by temperature, slight changes of color or luster in stones worn by the dying were perhaps noticed by others. The stone was thought to be connected with, and possibly the source of the sickness.

But the real impetus to the superstition came when Sir Walter Scott published his novel, 'Anne of Geierstein' in 1829. Anne's grandmother, Hermione, was an enchanted maiden who wore an enchanted opal. The stone reflected all the moods of its owner and was interwoven with her fate. When holy water accidentally touched the stone, it became suddenly lifeless, and within a few hours both it and Hermione had vanished into a pile of ashes. One compiler says that within a year of the publication of the book, opal prices fell as much as 50%.

The large stone in the center is The Flame Queen, 233 carats. Above, is The Queen Alexandra, 75 carats, and to the right is Forest Fire, 66.6 carats. The other stones range in weight from 16 to 72.75 carats.

Cover: The large triangular stone at lower center is The Sydney Queen, 43 carats. It and the other opals are set in platinum with diamonds and other precious stones. The Sydney Queen is one of the finest black opals in the world.

Another supposedly bad luck opal was in a ring owned by Alfonso XII of Spain who died in 1886. This stone supposedly caused the death of Alfonso's wife, grandmother, sister, sister-in-law, and finally the king himself. To the superstitious and to the myth makers the fact that an epidemic of cholera happened to be raging through Spain at the time had nothing to do with the series of deaths. The already suspect stone was blamed instead of poor sanitation in an ancient palace.

Most of the superstitions come from incidents such as these—on the other side, there are just as many stories about opal bringing good luck and large fortunes. Black opals in particular are supposed to be lucky.

The Newman opal collection, probably the world's finest, was shown at the Los Angeles County Museum of Natural History last November through the courtesy of Mr. James M. Kazanjian, noted Los Angeles gem expert. Mr. Kazanjian recently purchased the collection for the philanthropic Kazanjian Foundation.

The most unusual stone in the collection is "The Flame Queen." It weighs 233 carats, is oval shaped, and measures $2\frac{3}{4}$ inches by $2\frac{1}{3}$ inches. The stone is unique because of its color contrasts. Depending on the angle of view, the raised central area ranges from "bright red to bronze, gold and green. The narrow border is pin-fire blue, green and purple.

Three other outstanding stones from the collection are included in the illustrations. Set in a diamond necklace, the 43 carat "Sydney Queen" is a fine black stone with red flashes. "The Queen Alexandra" weighs 75 carats and is a gray stone with beautiful red, gold and green fire. The third stone in this group was named "Forest Fire" for the sparkling red and green pattern resembling fire raging through a stand of trees.

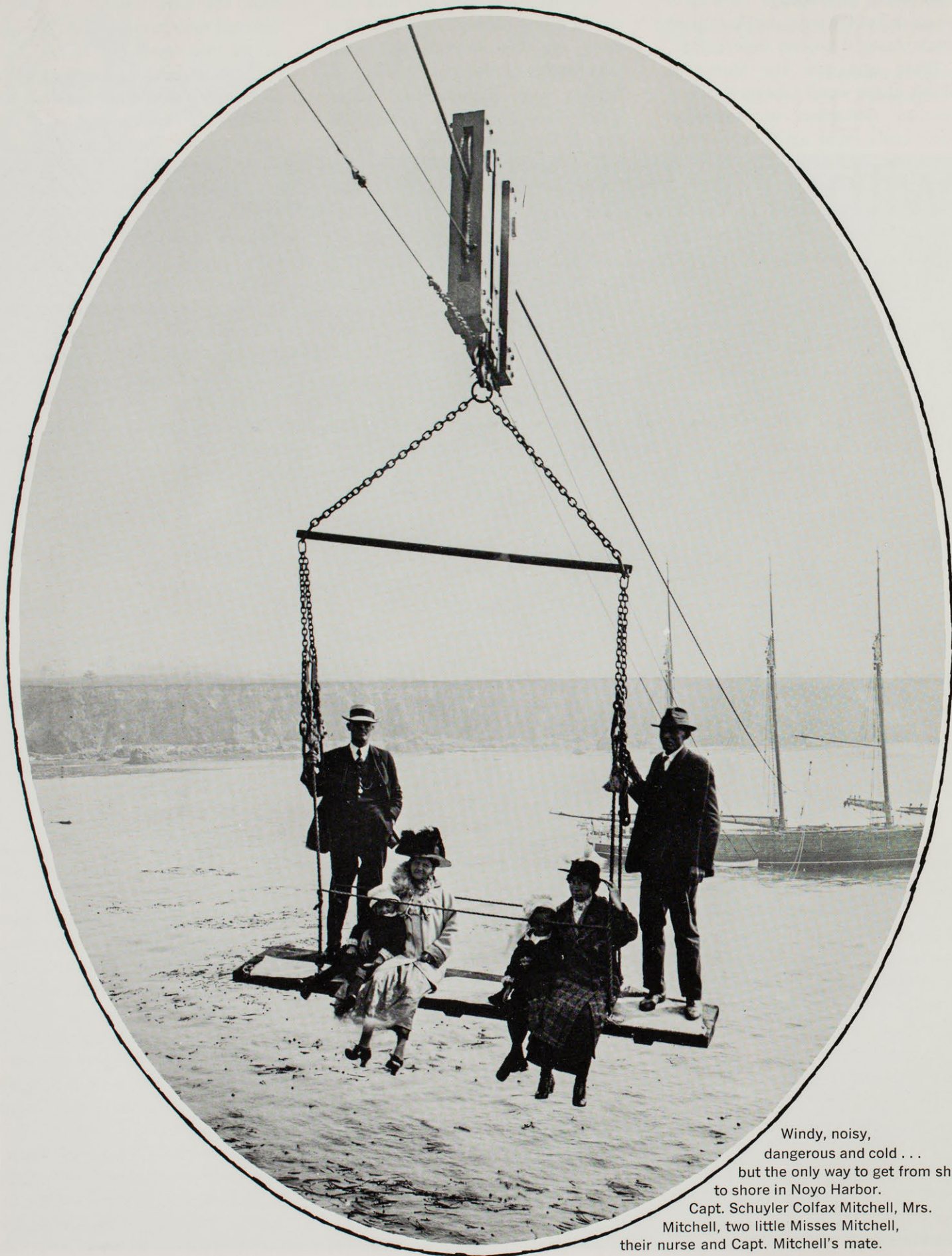
Australia is famous as the source of both "white" and "black" precious

opal. The term "white" or "black" does not refer to the brilliant fire within precious opal, but to the basic background color of the stone. Most commonly seen in jewelry, the "white" or "milk" opal is a light colored stone. The "black" type is far rarer, and has background colors of gray, bluish black or black. These rare stones come mostly from Lightning Ridge in New South Wales. These fields were opened about 1905 and still produce a few stones today. The opal at Lightning Ridge is found in small chunks, or "nobbies" as the miners say, in a soft clay beneath twenty or so feet of overburden. At Andamooka and Coober Pedy, two other major Australian fields, "white" opal is found in veins and seams in Cretaceous sandstones. (The Cretaceous period ended about 70 million years ago.) Opal is always a secondary mineral filling cracks and voids, or replacing organic material such as bone, wood or shell.

Opal is an amorphous mineral; this means that it has no ordered internal structure, and forms from a "gel" of silicon di-oxide and contains up to about 20% water. Scientists believe that this contained water may cause the fragility of the stone. It sometimes breaks in polishing, or afterwards, for no apparent reason. This fragility probably contributes to the superstitions surrounding opal. The stone is soft, as well as fragile, and must be worn and handled with care. On the mineralogist's scale of hardness (Moh's scale) opal is $5\frac{1}{2}$ to $6\frac{1}{2}$. This is softer than quartz (7) and harder than apatite, a phosphate mineral. The stone is lightweight, with a specific gravity of around 2.00 to 2.20—or twice the weight of pure water.

Opal is quite porous and may absorb oils or chemicals. This property has been used on occasion with poor quality stones to cheat the purchaser. An oiled stone sometimes appears of high quality, but the oil dries in a few months, and the colors fade. One sure way, incidentally, to ruin a good opal

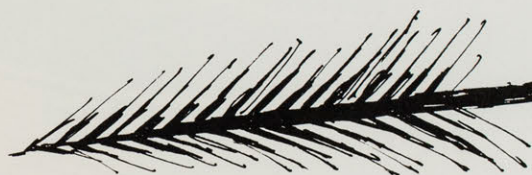
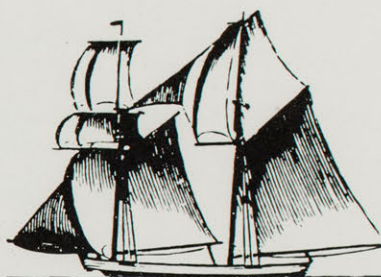
continued on pg. 30



Windy, noisy,
dangerous and cold . . .
but the only way to get from ship
to shore in Noyo Harbor.
Capt. Schuyler Colfax Mitchell, Mrs.
Mitchell, two little Misses Mitchell,
their nurse and Capt. Mitchell's mate.

San Pedro Bound with Lumber from the Mendocino "Dogholes"

by Robert A. Weinstein
Research Associate
History of Photography



Southern California has ever been the land of wondrous promise. This is the land that had everything . . . or practically everything. You name it and Southern California had it. Try naming lumber, building lumber and Southern California **didn't** have it.

For years this lack didn't matter at all. The local Indians didn't need sawn lumber for their homes. The early Spaniards and Mexicans made sensible use of adobe brick for their homes.

It was when we Easterners arrived here in the early 1800's that the lumber shortage showed up. We not only came, we imported our Eastern tastes and styles in everything from clothes to houses . . . wooden houses . . .

fancy wooden houses that needed lumber in large quantities.

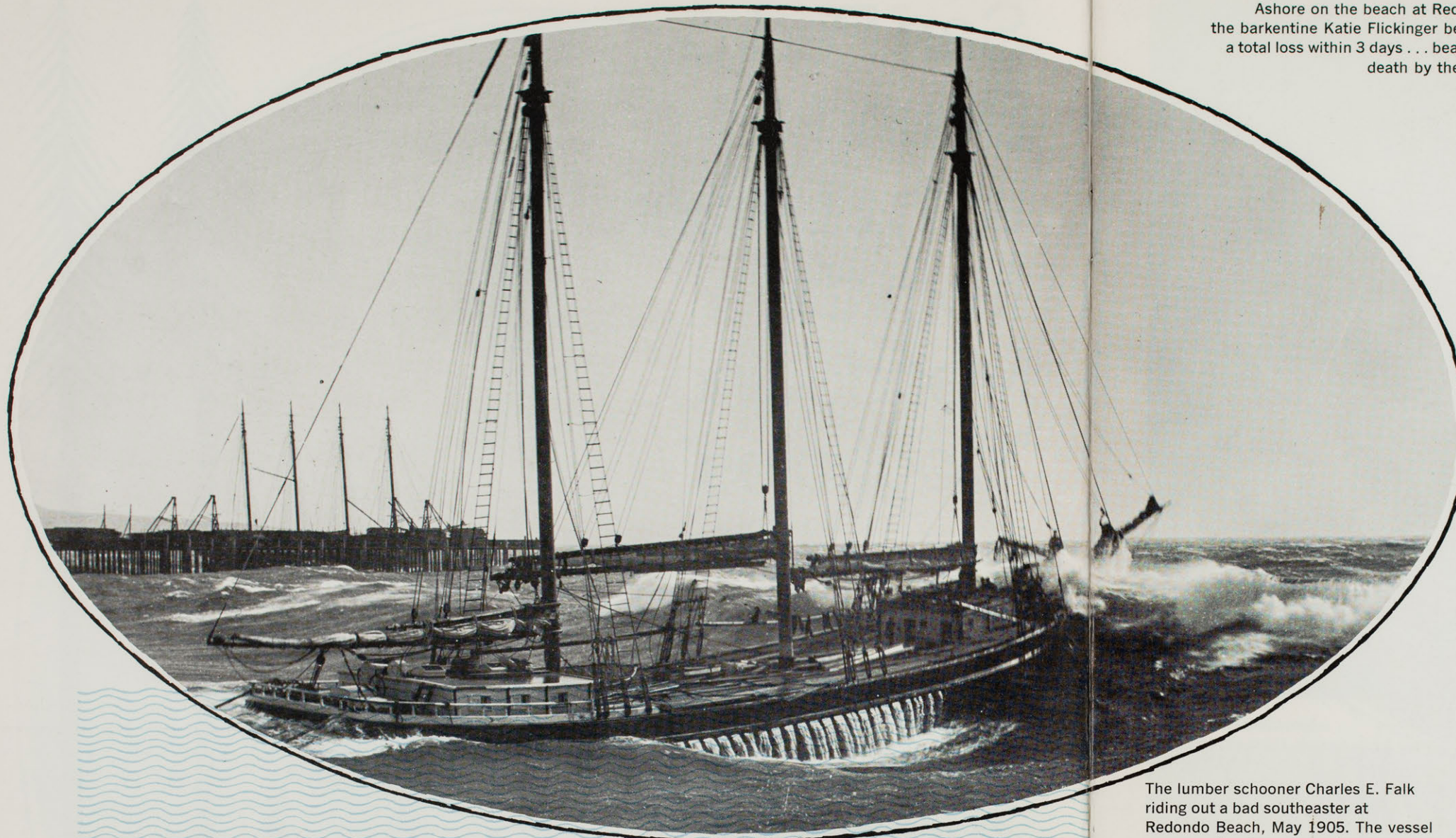
It is a mistake to think that we had **NO** lumber in Southern California. We did . . . it just wasn't suitable for building lumber, it wasn't near enough and it was too darned expensive to get down out of the mountains.

It did not take us long, however, to discover that if we couldn't get lumber in Southern California . . . we **could** get it in Northern California. They had redwood up there . . . noble trees, noble building material. From Fort Ross clear up some 500 odd miles to Crescent City the woods were full of just the kind of lumber Southern California needed badly. Northward into

the Pacific Northwest there were stands of Douglas fir . . . that incredibly useful wood that could be used for almost anything a carpenter had in mind. Between the Pacific Northwest and the Northern California coast there were untold millions of board feet of lumber growing wild.

There were only two problems . . . how to get the lumber out of the woods sawn for shipment, and then, how to ship it where the users were waiting for it.

One hundred years of Eastern lumbering experience and a modest capital investment answered the first problem. A couple of thousand sailors and a couple of hundred small ves-



The lumber schooner Charles E. Falk riding out a bad southeaster at Redondo Beach, May 1905. The vessel was saved but her cargo of lumber was lost.

Ashore on the beach at Redondo, the barkentine Katie Flickinger became a total loss within 3 days . . . beaten to death by the surf.



sels, both sail and steam, answered the second.

Roads out of the woods to the growing cities didn't exist . . . Trucks had not yet been invented and as for railroads . . . HAH! The only way into the woods **and** the only way out was by sea.

You need to have seen the Northern California coastline to realize what that meant . . . getting in and out by sea. It was a coastline practically all rock . . . steep rocks forming the shores and wet lines of rock running far out to deep water. These are well known as reefs. **Any reef** could rip the wooden bottom right out of a vessel . . . and on the Mendocino Coast too many did just that.

There were no harbors . . . none were possible. In a very few places as at Fort Bragg, a wharf was built enabling a vessel to load lumber alongside. In almost every other case there were only deep or shallow coves and river mouths emptying to the sea. All of these were either bar-bound or rock studded . . . not infrequently both.

These coves became quickly known to the seagoing fraternity as "dog-holes" in respect to the notion that as harbors they weren't fit for a dog to lie in. In genteel, shore-going talk they were known as "outside" ports. Why? Simply because a vessel had to lie "outside" in the tossing sea to load lumber . . . not in the relative safety and security made fast to a stout wharf.

This Mendocino coast is still notorious for sudden impenetrable fogs, quickly rising westerly gales, high surf, reef studded entrances to the "dogholes" and poor holding ground. The last means that an anchor tends to pull out of the sea bottom instead of holding the vessel securely in position as the weather worsens.

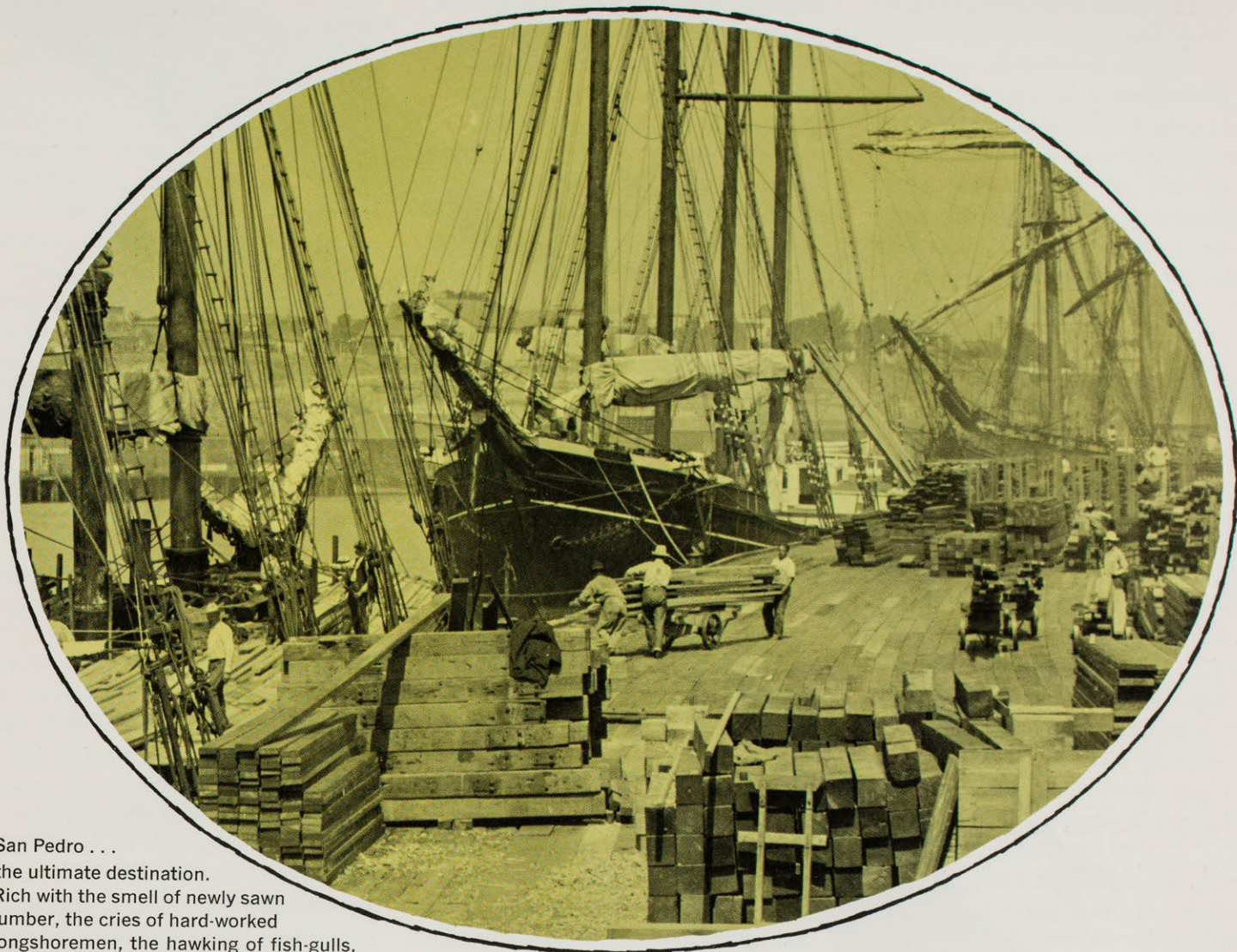
The daring ones who settled this inhospitable coast have left their names in the little "outside" ports. One can still find Cuffey's Cove, Bourne's Landing, Iverson's Landing, Stewart's Landing, Cleone, Newport, Rockport, Albion, Navarro, Point



Classic Mendocino . . . a firewood schooner
loading under the chute . . . everything
is classic but the weather . . .
it should be dreadful.

The way lumber was loaded . . . down
the chute to the anchored schooner
moored below . . . near the rocks . . .
near the breaking surf . . .
always in danger.





San Pedro . . .
the ultimate destination.
Rich with the smell of newly sawn
lumber, the cries of hard-worked
longshoremen, the hawking of fish-gulls,
the discharging was a sight to be
remembered.

Arena, Noyo, Little River, Big River
and on and on.

There were only two ways to load
lumber on this coast . . . both danger-
ous. High on a cliff at the mouth of a
cove a building was set up housing a
donkey engine and one end of a long,
stout wire. The seaward or other end
of this wire was shackled into a log
buoy afloat in the sea. On arrival a
lumber vessel picked up this wire and
so arranged it that a sling carrying
about 1200 odd pounds of sawn lum-
ber slid down the wire, by gravity, to
the deck of the waiting vessel, there
to be unloaded and stowed by the
crew.

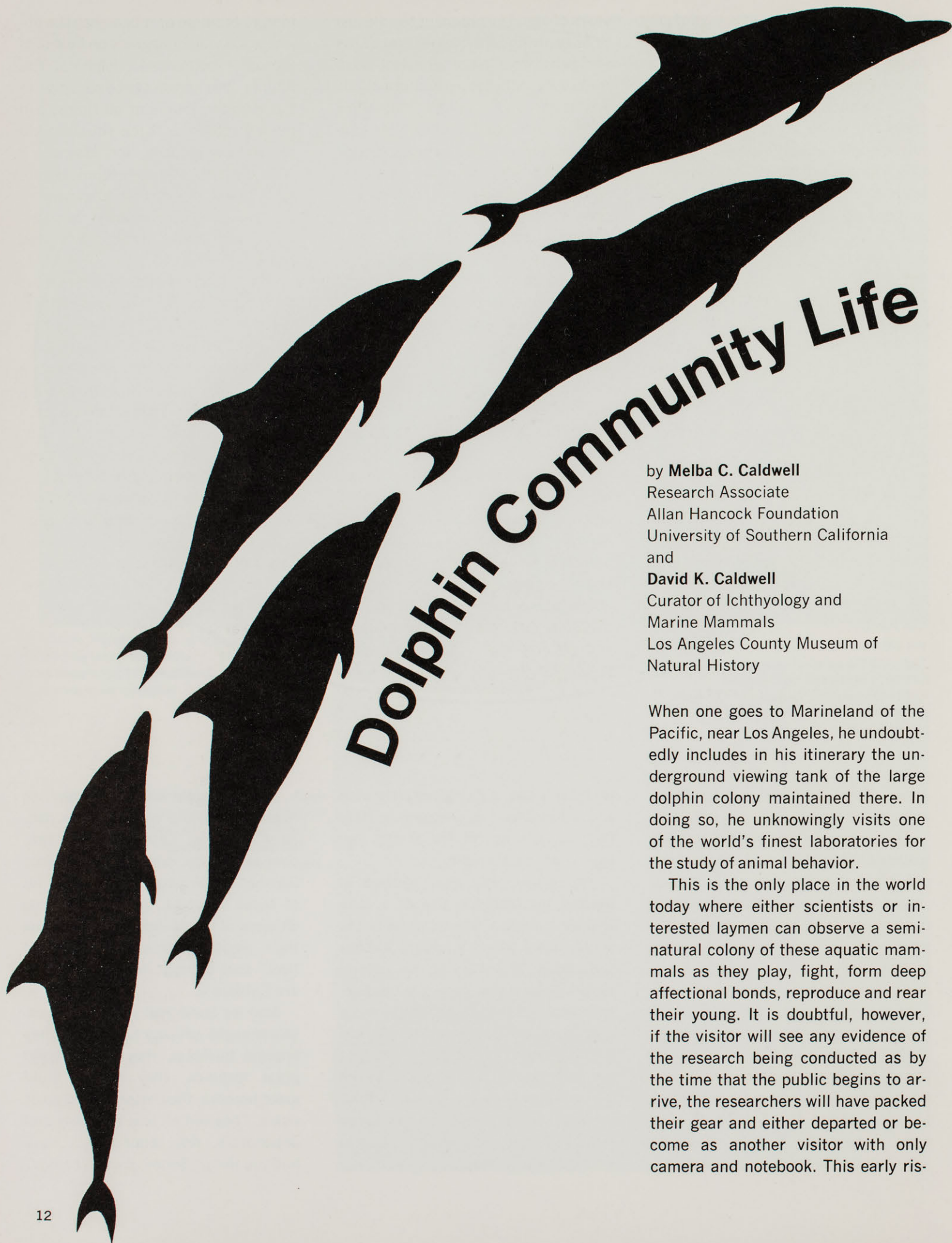
Imagine doing this in icy weather,

on a lively sea, a rising westerly wind
and a touch of fog creeping in from
the sea. It's not fit for a dog, you
say . . . ah, that's right.

The other dangerous method of
loading involved the use of a long
wooden trough, a "chute" built on the
shore, down which a load of lumber
slid, again by gravity to the waiting
vessel below. The particular danger
here was that that vessel had to moor
very close into the shore to get into
position under the chute. Altogether
too darn close if bad weather was in
the making. Only the passage down
the coast to San Pedro or San Diego
remained after completing loading in
the "outside" ports.

The trip might be a "milk run" or
might be just the opposite. The dan-
gers were fog, heavy weather, fire,
poor navigation, calms or even a Mate
that had "too many for the road." All
of these troubles, plus the normal
dangers of the Mendocino coast took
their inevitable toll of the "firewood
fleet" that brought lumber to South-
ern California.

Now we know that these little ves-
sels brought not only lumber . . . they
brought business, they helped build
great fortunes, they helped build
great harbors, they helped build great
cities. They did all this regularly and
dependably. Any sailor would have
told you then, "Sonny, it wasn't easy."



Dolphin Community Life

by **Melba C. Caldwell**
Research Associate
Allan Hancock Foundation
University of Southern California
and

David K. Caldwell
Curator of Ichthyology and
Marine Mammals
Los Angeles County Museum of
Natural History

When one goes to Marineland of the Pacific, near Los Angeles, he undoubtedly includes in his itinerary the underground viewing tank of the large dolphin colony maintained there. In doing so, he unknowingly visits one of the world's finest laboratories for the study of animal behavior.

This is the only place in the world today where either scientists or interested laymen can observe a semi-natural colony of these aquatic mammals as they play, fight, form deep affectional bonds, reproduce and rear their young. It is doubtful, however, if the visitor will see any evidence of the research being conducted as by the time that the public begins to arrive, the researchers will have packed their gear and either departed or become as another visitor with only camera and notebook. This early ris-

ing and somewhat devious technique has been adopted because of the extreme interest of visitors in acquiring information regarding dolphins. Any evidence such as electronic gear that leads the visitor to believe that one might qualify as some kind of "scientific expert" (whatever that may be) leads to barrages of questions which, although allowing the researcher to meet a lot of fine people and engage in much pleasant conversation, does not measurably increase his knowledge of normative behavior in a colony of bottlenosed dolphins. Hopefully this article will serve as an apology for this deviousness on our part and pass along to our readers a few of the things that we have learned in the past five years about this intriguing species.

The colony at Marineland of the Pacific consists mainly of the Atlantic Bottlenosed Dolphin (*Tursiops truncatus*) of "Flipper" fame, and contains animals of assorted sizes and sexes. For about two years we have conducted what are termed "normative" behavior studies on this colony. This means simply that the animals are watched, tape recorded and notes made on an animal group in which the only human contact that is allowed occurs when an attendant throws fish or squid into the tank, making certain that each individual receives all of the food that it needs.

During this period we have recorded the behavior and monitored the vocalizations by means of an underwater hydrophone and tape recorder. The tape recordings are important to the research because of the heavy reliance on acoustic signalling that the aquatic environment has forced upon these animals.

Two live births, as well as one still-born, have taken place during this period and this article will deal primarily with the events just prior to, during and for up to two years following the birth.

This species is believed to reach sexual maturity at about five to seven

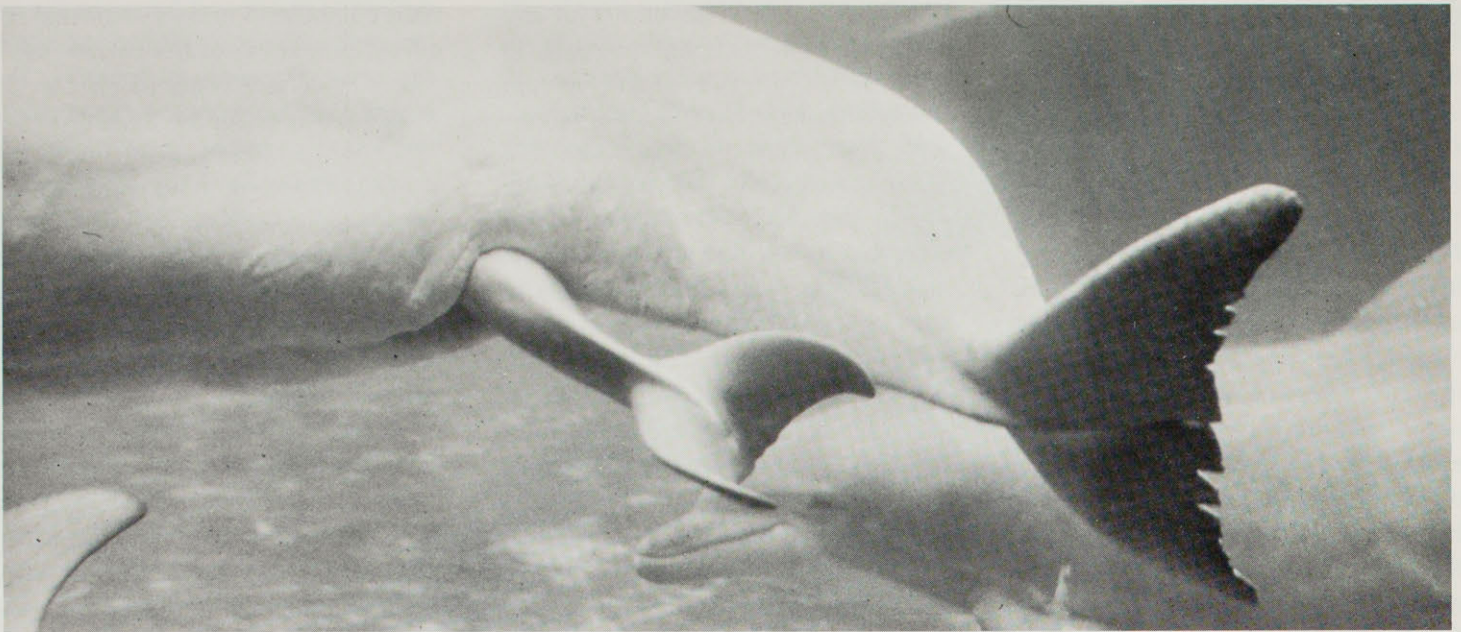
years of age. The pregnant female just prior to giving birth usually withdraws somewhat from the other members of the colony. After obvious contractions and other signs of the impending birth, a successful delivery takes approximately 30 to 90 minutes. Unlike land mammals, the infant is almost always born flukes first, probably to prevent death by drowning before the delivery is complete. The instant that delivery is complete, the normal infant surfaces to breathe. On the other hand the mother reacts immediately to an infant that does not surface to breathe, as in the case of a stillborn, and pushes it to the surface during these highly critical first moments of life. It is doubtful if a newborn at first could survive more than 30 to 60 seconds without air. It has been reported that frequently another older female, termed an "auntie," stands by to assist the mother at this point. Although we have only observed this particular behavior on a very uncertain and short-term basis by other bottlenosed dolphins, we have seen other females of a quite different species swimming and playing with the bottlenose infants and guarding them from too aggressive encounters with other bottlenosed dolphins. This protection has been needed only occasionally in the safe confines of the laboratory tank, but has occasionally been necessary to protect the inexperienced young from the sexual aggressiveness of the large male in the tank. This second species in the tank is the smaller Pacific Striped Dolphin (*Lagenorhynchus obliquidens*). The two striped dolphins in the Marineland community tank have shown themselves to be more limited in their behavioral and vocal repertoire, but are more beautiful, more agile and less inclined toward aggression than the bottlenosed dolphins. One of these striped dolphin females will frequently entice an infant bottlenose from its mother's side, an act which seems agreeable to all parties concerned, and swim and play with it until the infant returns to the

mother to nurse or it becomes the object of too violent aggression by one of the other bottlenosed dolphins. The mother, who appears to be sensitive to the infant's welfare at all times, will quickly intervene if the situation becomes too difficult for the small striped dolphin. In the accompanying photograph the mother is shown in the background, obviously watchful, while her infant swims with the striped dolphin.

At the moment of birth, the mother begins what is known in porpoise parlance as "whistling." We believe that it is at this time that the infant learns to recognize and react to its mother's "voice" which is characteristic and different in each animal that we have recorded. During this period, which lasts for several days during which the emissions of sound gradually diminish, the mother doubtless also learns to recognize the infant's whistle as well. To date we have followed an infant from birth through 18 months, and its whistle has remained the same. We do not know if there is a change at sexual maturity.

Immediately after birth the infant begins swimming with its mother, usually in body contact or very close to her where the laws of physics and hydrodynamics permit it to have a "free ride" no matter how fast the mother may swim. At first the mother herds the infant in circles away from the tank walls and the other members of the community. Gradually the others are allowed to approach but the mother may at any time swim quickly away or interpose her body between the infant and another animal. The "free ride" allows the infant to keep up with its mother even during these fast escape maneuvers.

Shortly after birth the infant initiates its first attempts at nursing. At first, these efforts may be directed toward any part of the mother's body, but with what assistance the mother can offer without arms, the nipples are eventually located. Newborn animals nurse as frequently as every

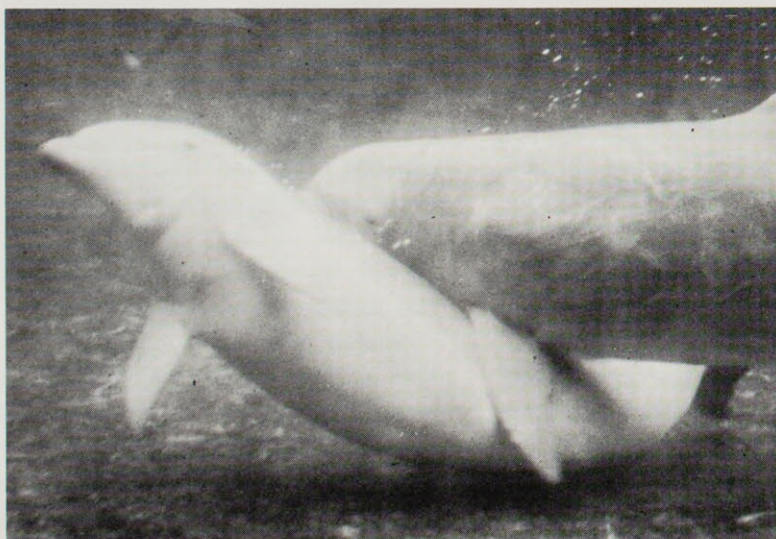


The moment just prior to birth as the new arrival begins to emerge tail first.



An infant Bottlenosed Dolphin swims with a female Pacific Striped Dolphin while his mother watches from close by.

A newborn Bottlenosed Dolphin hugs close by his mother's side and hydrodynamics take over to give him an almost effortless "free ride." A Pacific striped dolphin acts as "auntie."



Punishment of young dolphins by their mother may come just as suddenly as it does to humans!



thirty minutes and reportedly continue to nurse intermittently up to 18 months or longer, even after they have started to eat solid food regularly. One juvenile of one year of age in the tank at Marineland of the Pacific, which we believed to be completely on a solid diet because we had not observed his nursing for several weeks, resumed frequent nursing the day that a new infant was born into the tank.

At the age of a few weeks the infant begins to venture out from its mother, and swims alone or with other animals. The degree of permissiveness allowed by the mother is apparently a function of her experience and plays an important role in determining the range at which the young is allowed to stray. When the mother wishes to retrieve the young she whistles and attempts to herd it close to her. The infant may acquiesce or swim off quickly with another animal, inviting a chase.

We have rarely seen punishment inflicted on a young, but it does occur. The young may be pushed out of the water, wiggling and whistling in protest, or it may be pinned briefly to the bottom of the tank (an undignified encounter in which the infant also whistles loudly over the injustice of it all). To date we have not seen a mother use any form of punishment that would inflict actual bodily injury to her young, although she may, if pressed, turn on another animal in a true fight and ram or bite it severely enough to cause bleeding wounds. Play fights between mother and young, as well as between any two individuals in the tank, may occur, but the low intensity of the blows and mouthing are obvious.

The question most frequently asked of us is "Do they communicate with each other?" If by these words the questioner means "Do they convey information to others of their own species?", the answer is, of course, "yes." We know of no animal that does not, by chemical, visual, tactile or auditory signals, give out informa-

tion that is useful to others of the same or even different species. In general, the amount of information varies and increases the more social or highly evolved the species becomes. The information conveyed, for example, may be the proximity, sex or emotional state of the animal, the whereabouts of food or the presence of danger.

If our questioner means "Do they use words?", the answer is "No, evolution seems to have spared them this." They are not able to pass along a lot of possible information, but neither are they able to pass along a lot of misinformation. Our use of words can hardly be classified as an unmixed blessing.

The one aspect of the behavior of this species that is of the most significance is the sexual behavior. Two very excellent scientists, the one an anthropologist and the other a student of non-human sexual behavior, pooled their knowledge and arrived at what has now become an axiom in animal behavior; i.e., as an animal ascends the evolutionary scale, less and less of the sexual behavior is controlled by the lower brain centers and more and more by the cortex. This tends to free sexual behavior from a rigidly predetermined pattern to variable patterns that lie under the control of the individual, his environment and previous learning. The first infant that we observed gave evidence of sexual arousal at two days of age when it had an erection when it inadvertently brushed its genital region against its mother. The full biologically effective copulatory pattern was practiced by this animal by the age of six weeks. This is significant in an animal that is not sexually mature until a minimum of five years of age and quite possibly six or seven.

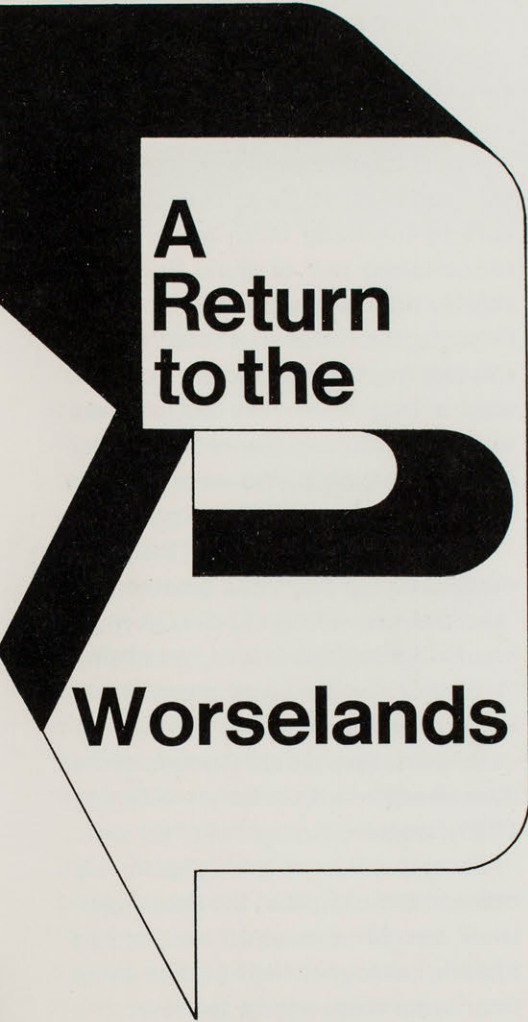
Of even greater significance is the variety and duration of sexual behaviors that are not biologically productive. Homosexuality and self-stimulation are practiced frequently by all members of the bottlenosed dol-

phin colony at Marineland of the Pacific. No member of the colony is immune from sexual approach by any other regardless of the ages or sexes of the participants. The reaction to the aggressor may initially range from flight to cooperation, but most frequently ends in elaborate mutual sex play or copulation. The stimulus or object of temporary sexual interest may be animate, such as the mother, a member of another porpoise species or a turtle; or an inanimate object including the public viewing windows. Dolphins, therefore, seem to have evolved to the point of being free to choose the sexual object, perhaps even more so than humans, as we have not to date observed a dolphin that became fixated on a biologically inappropriate stimulus to the exclusion of the biologically appropriate one.

It has been evident in the two male infants, the development of whose sexual behavior we have followed closely, that the first sexual arousal is derived from the close body contact with the mother. The mother, whose genital area and mammary glands are in close spacial proximity, probably receives sexual stimulation, of a kind seen practiced by adults, who probe the recipient's genital region with their snouts or lower jaws, from the infant's act of nursing. In our observations the mother has been the recipient of the infant's first copulatory attempts. The mother's reaction varies from permissiveness to active solicitation, and we have seen only one instance in which a juvenile was aggressively rejected. Thus experience and lack of incest taboos undoubtedly contribute materially to the prevention of a permanent fixation of displaced sexual drive in a species that has evolved away from a rigidly set sexual pattern.

Support for much of our work has come through grants from the National Institute of Mental Health (MH-07509-01) and the National Science Foundation (GB-1189).





A Return to the Worselands

by J. R. Macdonald
Senior Curator of
Vertebrate Paleontology
and
Douglas J. Macdonald

In 1964, a Museum field party spent three months camped near Sharps Corner on the Pine Ridge Indian Reservation in southwestern South Dakota working the White River Badlands and the overlying early Miocene deposits. This was an extremely productive summer. Curator Macdonald had been working this area since 1953 and has published a monograph on the fossil fauna of the Miocene beds. This field trip was a continuation of the work and at this writing has produced another two inches of typescript toward another monograph.

Layman Macdonald, Chairman of the Museum Alliance Board of Directors, spent two weeks of vacation time on the 1964 field trip and recorded his experiences for the Quarterly in "Fossil Hunters of the 'Worselands.'" Having been bitten by the fossil hunting bug, he joined the field party for another two weeks in 1966, and we decided to do a joint article on the party's activities.

The Macdonalds are not related; distinction is sometimes made, depending upon who is talking, by referring to them as Macdonald the "Elder" and the "Younger," or as Macdonald the "Greater" and the "Lesser."

The Curator's Viewpoint

The 1966 mission was to collect mammalian fossils from the very top of the Oligocene beds and the base of the overlying Miocene rocks, the emphasis to be placed on the Oligocene, and particularly in a series of greenish stream channel deposits near the top of the section known as the **Protoceratops** channels. Three objectives were established: 1) to obtain ancestral material of the forms found in the early Miocene rocks; 2) to begin filling out a void in our reference collection; and 3) to add to our potential exhibit material.

The trip was made possible through the generosity of Mrs. E. Hadley Stuart, the newest member of the

Museum's Board of Governors. Plans were made to invade the Badlands in mid-August after the summer rains had diminished and the weather was beginning to cool. The party was to meet at Sharp's General Store on the Pine Ridge Reservation (about a half mile from our 1964 camp) at noon on the 17th of August. Three members of the party; "Joe" Cocke, preparator; Wressy Cocke, father, and Doug Macdonald, layman, left Los Angeles on the 15th and, through incredible mismanagement, arrived at the meeting place 15 minutes late. The other two, John Chadwick and I, came in from the north where we had been visiting the Garbani dinosaur party near Jordan, Montana. John, who at one time had collected for Cal Tech, had been doing a monumental digging task on the big Trachodon or duck-billed dinosaur skeleton that was being excavated. I had spent my time playing "El Patron": inspecting the work, making unneeded suggestions, and being photographed in the movie that was being shot of the operation.

After my displeasure over the late arrival of the Los Angeles party had been expressed, we headed out to establish our camp. If you look at a highway map of South Dakota, you should see a road running from U.S. Highway 18 to Wounded Knee—Porcupine—Sharps Corner—Rockyford—Scenic. Just east of Rockyford the road crosses the White River. Our camp was to be established on the south side of the White River about six miles east of Rockyford. In order to get there, we had to go ten miles north on the highway and then head south-east on some ranch roads and fire trails to the north bank of the river opposite our camp site.

After twelve miles through the sand hills and six gates, we forded the river and set up our camp on the south side of the river. About four miles to the south of us was the southern wall of the Badlands, a 400-500 foot wall of cliffs with many northward extending ridges which restricted our activities

to the canyons and the flood plain of the river. We were camped on the great sheep ranch of Otto Wolff for whom I named one of the new animals found during the 1964 Summer.

The next day found us prospecting where we had left off in 1964. We found a few things in the **Protoceras** channels. Doug Macdonald and I climbed to the top of several ridges to look down in the neighboring canyons for good channel exposures, and we spotted what looked like the Promised Land. That night we had June in August, and it rained an incredible rain. When it rains in the Badlands, fossil hunting and digging comes to a complete halt. The outcrops become so greasy from the wet clay that it is impossible to drive on the level or to keep your footing on the slopes.

The nineteenth was a lost cause for paleontology. We sent the Cockes off to Rapid City and the Black Hills to be tourists and to visit the South Dakota School of Mines Museum of Geology and Mount Rushmore. Doug, John and I went to Pine Ridge and a tour of the Reservation. There was more rain that night, and the White River became unfordable; it rose almost three feet. Finally on the 22nd we were able to get into the Promised Land and began serious prospecting. Almost immediately Chadwick found a two foot long "pig" or *Entelodon* skull on the side of a cliff about fifty feet above the prairie surface. Normally we would put the finder to work digging his discovery, but as this was to be John's last day with us, we let him go on prospecting.

The Cockes were put to work on the *Entelodon* skull, and with fly-like adhesiveness they stuck to the cliff face. The skull led on into about half of the skeleton so the simple excavating job took on greater proportions. Doug and I continued prospecting the channels and found a variety of things to add to our reference collection. One day was spent twenty miles away in another locality of the same geologic level discovered during the 1964 season. This

change of scene constitutes a day off for one of my field parties.

On the last day of August, I took the group to the Rapid City Airport and abandoned them to the horrors of urban life. That afternoon they were replaced by another preparator, Floyd Humeston, who was to finish out the season with me.

Floyd and I continued working the same area for another week, finding new material and completing the excavation of specimens already discovered. Finally, in order to prospect the same area from the top, we moved to Sharps Corner and camped behind Walter Sharp's General Store. The move paid off, as the last specimen we found was a complete skeleton of an *Oreodon*, a sheep-like animal from the base of the Miocene beds.

At last in mid-September our time was up, and we had to head home. We had not collected a great tonnage of material, but we had added several heretofore unknown animals to our collection and filled in a great blank in our reference collection. Floyd and I separated at Agate, Nebraska, Floyd heading directly home with our truck and trailer load of fossils and gear. I went via Denver, and McCoy, Colorado, and Provo, Utah, to do some trading and to look in on some more dinosaur prospects.

The Layman's Viewpoint

One may be disappointed upon returning to a vacation spot, expecting the same excitement and enjoyment experience during the first visit. However, last August when I again looked out across the vast disorder of the South Dakota Badlands, the pulse-quickenning urge to explore the twisting gullies and steep cliffs was as strong as ever. There they towered, blazing in the late afternoon sun, red and buff against a darkening eastern sky.

Our party converged on Sharp's General Store from two directions. Joe Cocke, a museum preparator, his

father Wressy Cocke, and I had driven a truck full of equipment up from the Museum in Los Angeles. Dr. Reid Macdonald who was to lead the party, and John Chadwick, a Museum Alliance Director, had driven down from the Museum's dinosaur location in Jordan, Montana, where they had been helping Harley Garbani's field party.

After a brief rest and discussion, we drove north and then turned east, off the highway, and bounced across country on dirt roads that rapidly degenerated into wheel track. Finally we arrived at a ford on the White River. I had been startling the natives of several states en route to Sharp's Corners by travelling in an ancient (but comfortable) pair of khaki Bermuda-shorts, so I was elected to walk through the stream ahead of the vehicles to probe for hidden potholes with a long stick. The bottom was rocky and firm and the water not over eight inches deep. We were to hear more from this gently flowing stream!

Several hundred yards to the west, we pitched our tents in a grove of tall trees that grew along the river. A fresh breeze rustled the leaves, promising to discourage the local mosquitoes. No farm houses and hot showers for us this time (see 'Fossil Hunters of the Worselands' — Quarterly — Spring 1965); we were "in the field" for sure.

Several miles of grassy plain lay between our camp and the actual badlands formation in which we planned to work, but four or five hundred yards from camp there were a few low hummocks of Brule Formation. Nothing would do but we should have a brief fossil hunt before dinner. We found only a few unimportant fragments but, undiscouraged, returned to camp, ate, and made plans for our assault on the major formations next day.

Dr. Macdonald had told us that we would be working mainly in the upper member of the Brule Formation. Laid down in Oligocene time, about thirty million years ago, it is composed



Cindy Harsen, wife of a South Dakota geologist, at the base of a pillar capped by **Protoceras** Channel sandstones.

mainly of red and buff bentonite clays and contains fewer fossils than some of the more recent formations that lie above it. Two summers ago we had worked in it briefly, and Reid had located some ancient stream beds that ran through it, their gravel bottoms now solidified to the consistency of poorly mixed concrete, projecting as ledges where the softer ground had eroded away above and beneath them. They are referred to as '**Protoceras** channels' since the remains of this earliest known horned ruminant are frequently found imbedded in them.

We were hunting 'ancestors' this trip—looking for the predecessors of certain species that Dr. Macdonald had found in the younger Sharps Formation during the ten years he had been working in the general area. There are older and younger mammals in the Museum collection, and we hoped to fill the gaps in the middle to show the orderly progression of the changes that had taken place in the group. Tired, but filled with anticipation of the next day's work, we crawled into our sleeping bags for the nightly snoring contest.

Rising about 6:00 A.M., we had a large breakfast, secured the camp, and were off in high spirits to get at those fossils. A thirty-minute ride

brought us to a basin from which three major valleys gradually narrowed into the rugged, steep-walled canyons characteristic of the badlands. Half way up the precipitous slopes, **Protoceras** channels wound along the walls. In several areas, undermined by erosion and broken apart by their own weight, they lay in huge, disorganized heaps at the foot of the cliffs down which they had rolled.

Separating into small groups, we selected areas to explore to be certain that no likely spots were missed. John and I climbed up to the channels to search their upper sides. Fossils lie all through the outcropping, but on top the cementation starts to break down in the wind and rain, and the fossils thus exposed are easier to collect than those imbedded in the protected sides or base of the ledges. The entire day was spent in walking, climbing, looking, and digging. Numbers of isolated teeth and bones were collected from the channels, and Dr. Macdonald found and marked a couple of skulls for later collection. Returning to camp, we found a visitor. A friendly shepherd had made camp near the ford and had brought in an ancient Dodge Powerwagon, a horse, and a yen to talk. The rigors of the first day had made dull conversationalists of

us all; he bade us goodbye rather sadly since we evidently weren't going to invite him to supper, and disappeared into the gathering darkness.

Knowing that a good night's sleep would restore us, we turned in, but South Dakota had a few surprises for us. About midnight thunder and lightning awakened us and we awaited the dawn with growing apprehension. And by dawn our soft breeze was a howling gale of wind and rain that can only be described as a 'frog-strangler.' The gently-flowing stream at our back had risen two feet during the night and was now a swift and muddy torrent—too thick to drink and too thin to plow. Out in the Badlands the bentonite clay, swollen by the rain, was like grease underfoot, yet it clung to our boots like glue. Cut off in all directions we could do no more field work until the land dried out. All day and part of the next, we sat in our tents and read magazines, talked, slept, groused about the weather—a thoroughly disgruntled group.

Seeing morale slipping fast, Reid decided to act. We borrowed the shepherd's truck—a red wreck of its former self—and fought our way out of camp on what is described locally as a road. We had to rebuild it in several spots in order to continue, so

we did get in our digging for the day. The grey skies held back their rain, so we made it out to the paved road and a drier, or at least less-muddy location which we searched for fossils, but with little results. The trip back to camp almost did us in at one spot. A short but steep hill rapidly dissolved into a muddy morass as we chewed up the road in four-wheel drive, trying to climb it. The truck went very well backwards, sideways, or a combination of both, but forward and up it would not go. We had visions of having to abandon our decrepit friend and hike many miles back to camp.

Fortunately we recalled an old military trick. We dug a hole at the top of the hill and buried our spare wheel. Hooking onto it with our cable, we winched ourselves up the hill and went on our way rejoicing. Actually this truck was a blessing in disguise. For several days following, when our own vehicles wouldn't operate on the slow-drying ground, it was our only transportation into the collecting area. We became quite fond of its mechanical eccentricities — so attached to it in fact that we sometimes referred to it as "that old red mother." Though the weather turned fine at last, the river dropped very slowly. When John Chadwick had to leave, we towed his car across the river with "mother" and didn't ship a drop of water. I guess we should have asked the shepherd to stay for supper after all.

Our luck improved daily, as skulls and jaws were discovered. John spotted the skull of an *Entelodon* (a sort of unlovely pig that stood about four feet high at the shoulder) well up the side of a cliff, and Joe and his Dad spent three days of hard labor digging and plastering it. We thought the fact that John found it the day before he left for home very suspicious. While the Cokes slaved away on the pig, Reid and I rode the Tote-Gotes up the canyons exploring new areas. A Tote-Gote is a slow, powerful motor-scooter, with rugged tires and no

springs. Having used them before Reid swore by them, while I swore at them, but they beat walking. In an hour's ride we could cover enough ground to equal half a day's walking. Once a location was found we could get to it quickly and later carry our finds back to camp easily, arriving in a reasonably fresh, though well-vibrated condition.

Field trips seem to bring out a friendly competition between Macdonalds. In World War II, Reid had been an Army infantryman in the Pacific and I had been a Marine artilleryman in the same area. When time hung heavy on our hands we would trade invidious comparisons about each other's branch of service. **Noblesse oblige** demanded that one follow where the other led, and each important find could usually be related to the merits of having served in the Army or the Marines. Prior to the trip I had rigged a contraption on a Himalayan packboard to carry tools and fossils with more ease. Having thus outsmarted myself, I often found myself carrying the heavier skulls back to camp. One hot day after Reid and I had dug out several skulls, I shouldered a heavier load than I now like to remember. Trudging along a rocky dry stream bed, my load grew progressively heavier, but as Reid was well-burdened himself, I was determined to stick it out. As we came in sight of camp, Reid, noticing my obvious distress, archly asked if I thought I could make it all the way. I replied that actually there was no problem because I drew strength by humming the "Halls of Montezuma" to myself as I strode along. The look on his face was worth the struggle!

The business of finding fossils, assuming a certain amount of experience and familiarity with the area, is often a matter of luck. Hunting techniques may differ, yet be equally effective.

One day Dr. Macdonald took the party into the Sharps Formation for a change of scene. This formation is

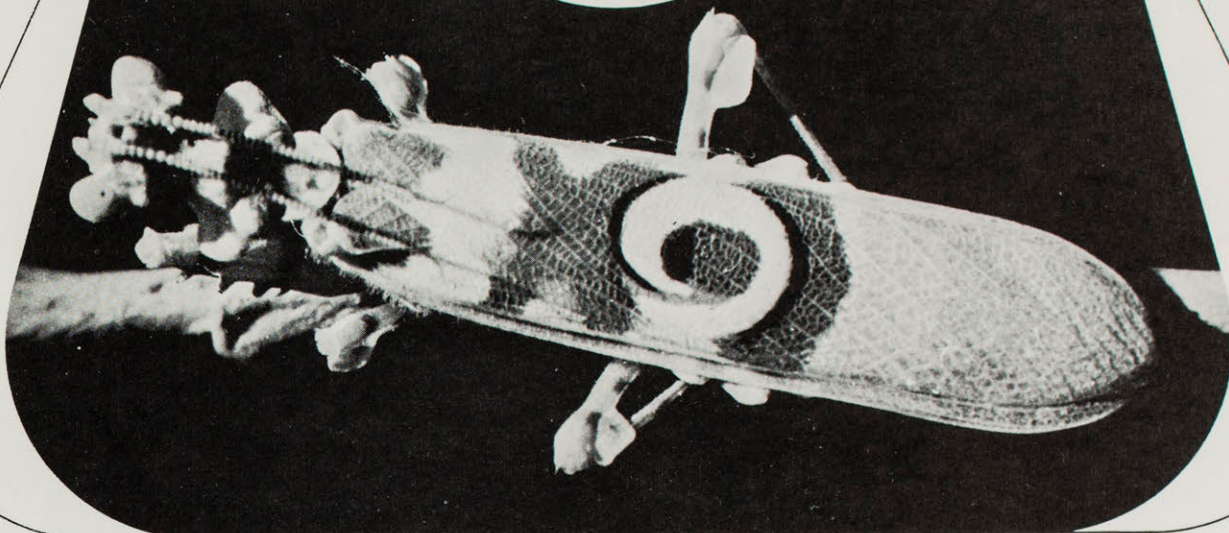
about twenty to twenty-five million years old and is characterized by nodules of hard material in a softer surrounding earth. It is full of fossils and provides good hunting. St. John's pit is a steep-sided ravine whose walls are well covered with loose nodules. One climbs about with all the grace of a drunken man ascending a mountain of greased marbles on roller skates, and it is well to have your hospitalization plan up to date. Despite all this, after one particularly aggravating fall down the hill, I walked around the base of a small knoll, nursing my bruises, and found the jaw of a completely new species of dog—one of two important finds made that day.

Time flew past as it had done on the previous trip. Days of digging and plastering tumbled after days spent visiting other locations. The pile of plaster-jacketed skulls grew larger. The field-books swelled with notes and data. Friends of Dr. Macdonald visited our camp and were taken fossil-hunting by the experts. By now we were all 'experts'—salty old fossil-hunters who could distinguish between the tooth of a rhino and an oreodont at forty paces! Then it happened—gold was discovered! History is full of instances where gold has upset the carefully laid plans of sober men and this was no exception. One evening I bit down on a piece of Reid's cooking, and out popped a large crown. With the long Labor Day weekend approaching, I either had to cut short my trip or spend four days searching golf-courses for my dentist.

Since the Cokes had planned to leave before me, I changed my reservations and we all flew back to Los Angeles together. Dr. Macdonald was joined by another member of the Museum staff—Floyd Humeston—and together they completed the work of this very successful and important field trip. We had enlarged the Museum's collection, found some of the 'ancestors' we sought, and added a bit to man's knowledge about the world in which we live.

Mdudu wa Uhuru

The "December 9" Mantid



by Charles L. Hogue Curator of Entomology

After so long a time I finally had the opportunity to thank Gary James personally for the insects he sent to the Museum from Africa. It had been two years since he left on his teaching assignment in Tanzania. Though most of his time went to his duties at Bwiru Boys' Secondary School, Mwanza, and Mkwawa High School, Iringa, I convinced him to spend his spare hours chasing insects. This he did with considerable success, adding several thousand specimens to our collection. When he visited me in my office recently, I was able to show him the fruits of his labors, neatly pinned and labeled, lined up in trays ready for sorting.

Passing his eyes over the drawers of specimens he said he could remember the circumstances of capture for many. One in particular reminded him of a story which I found fascinating and novel since it represented the actual genesis of a legend, which,

after only a few years, has become a part of East African folklore.

The celebrated insect is a species of preying mantid, common in Tanzania and much of East Africa, known to entomologists as *Pseudocreobotra walbergii* and to the Tanzanians as "Mdudu wa Uhuru"—Insect of Independence.

According to the neoteric fable, the mantid had never been seen prior to the independence of Tanganyika from British-U.N. Trusteeship on December 9, 1961. [A year later the country was proclaimed a republic within the Commonwealth and merged with Zanzibar in 1964.] The mantid seems to validate its own "miraculous appearance" on that very day with the pronouncement of the number "9" on its upper wings.

To further commemorate the event and add to the legend, the colors of the numeral correspond to the national colors as they appeared on the

first Tanganyikan flag—**yellow** (symbolizing the mineral wealth of the country) forming the body of the 9, **black** (representing the negro people who live there) bordering the figure and filling the left half of the center, and **green**, (symbolizing the agricultural foundation of Tanganyika's economy) flanking the number and filling the remainder of the center.

There is, of course, no basis in truth for the supposed timely manifestation of this insect. The species has been known to science since 1871. "Yet. . .," Gary relates, ". . . the story persists and I heard it from students in each of the schools in which I worked and also from local farmers as well as from the Regional Commissioner of Iringa, who would correspond to our governor. The Regional Commissioner sent one out to the school with the story, having collected it on one of his outings of which he was very fond."



by
Ed N. Harrison

Colors found in birds are more varied and often achieve a greater brilliance than any other class of land vertebrates. The patterns formed by contrasting feathers of our avian fauna are almost infinite in variety and range from large areas of a single hue to intricate stripes, spots, bars and subtle shadings from one color to another.

Certain species of fish, particularly those found among the coral reefs of tropical waters, are the only vertebrates that do rival the most brightly and strikingly plumaged birds in the intensity, luminosity and dramatic contrast of their colors. Aside from the fishes, only the insects, especially the butterflies and some beetles, can compete with the birds in the zoological world for the sheer brilliance and often gaudy effect of their coloration.

The majority of bird species, however, tend to be more obscurely tinted, with plumages of various

shades of brown, gray, olive, black and white. Since these are less apt to be noticed than are their brilliantly hued relatives they often seem to be in the minority to the casual observer who can easily remember the bright red, yellow and green birds, but forgets those with streaky brown, gray or tawny tones.

One common fallacy that should be dispelled early is the belief that bright colors are more characteristic of tropical birds than of species found in temperate zones. Actually, there are both brightly colored and dull plumaged bird in both areas, and the proportion of bright to dull colored birds is about the same in the tropics as in the temperate zones. It is true that if a list were made of all brightly colored birds in the world, it would be dominated by those from the tropics. But the same would also be true of a listing of all birds with subdued tones. It boils down to the simple fact that there are just more species found in

Upper Row (left to right): Senegal sunbird, Red-throated bee-eater, Desmarest's tanager, Splendid parakeet, Turquoise tanager.

Lower Row (left to right): Opalescent manakin, Horned sun-gem, Peacock ("eye" from long train feather), Berlepsch's honeycreeper.



the warmer parts of the world, so it naturally follows that this is where the greatest number of colorful birds would be found.

Bird colors result from the pigment in their feathers or the finely striated external barbs of their feathers, or a combination of the two factors. The glittering iridescent colors of hummingbirds, sunbirds, trogons and some pheasants, for example, are due to the minutely grooved surfaces of the individual feathers which act like diffraction gratings and break up the light into its component, prismatic colors. The actual pigment in these feathers serves more as a dark background, somewhat like the silvering on the back of a mirror. As the birds flit about, their apparent coloration changes according to the angle at which the light hits these feathers, and the resulting extent to which it is diffracted and reflected.

In a large number of species there is a marked difference in coloration between adults of the two sexes. The males are generally the more brightly colored, with the females having duller, more obscure colors which offer certain protective advantages from enemies when on the nest. The relative inconspicuousness of the females not only helps to protect the adult bird, but also the contents of the nest by reducing their visibility to potential predators when brooding eggs or feeding young.

There are, however, some species in which both sexes are brilliantly but quite differently colored. Such is the case with a large parrot of the South Pacific islands, *Lorius roratus*, in which the male is bright emerald green with red flanks and yellow tipped tail feathers, while the female is bright red with the lower parts of the body tinted a deep purple and red tipped tail feathers.

In a few birds, such as the phalaropes, the males are dull colored and the females brightly hued. With these species it is the males who assume responsibility for the eggs and young

while the females do not go near the nest once their eggs have been laid.

The evolution of brilliant color patterns in birds is apparently closely related to special courtship displays. It is generally the case that when a male has bright or unusual markings, or elongated plumes, his courtship display behavior tends to reveal, even enhance, the visible effect of these characteristics. This is most notably the case with the birds of paradise, a group of birds related to our common crows, in which the production of unusual plumes and colors has greatly exceeded that of most birds. The peacock, when it spreads its gorgeous "train" for the peahen, is another good example.

Aside from the visual pleasure human observers derive from the beautiful colors of some birds, the patterns of many species are of great interest as examples of concealing coloration in which they match the immediate background, and as instances of "countershading," where the colors are darker above and lighter below to compensate for the light falling on the back and the shadow cast on the underparts of the body, thereby helping to make them less conspicuous.

The arrangement of various colors in each of the feathers is constant throughout the infinite number of individuals in each species. Thus, if, for example, there is a red spot on the inner web of each of the three outer tail feathers and not on the others, you will find this holds true for all the countless specimens examined. When consideration is given to the intricate process of feather growth and the delicate biological "timing" required to localize the laying down of the red pigment in just the right portion of just the right feathers, the end result, often of great complexity, is something that commands respectful admiration. Moving from such a relatively simple marking to the highly elaborate ocelli or "eyes" on the long feathers of a peacock's train, the pic-

ture then becomes enormously involved and almost beggars description.

The over-all coloration of birds as well as the details of all portions of the plumage merit close study. In some groups of birds, such as the tanagers, all conceivable colors have become involved, while in others, such as gulls, the total range of variation is limited to different combinations of black, white and gray. The plumage of the young in many species is quite different from that of either parent. The colors of some adult birds differ greatly from the breeding (summer) season to the non-breeding (winter) months. Each plumage is adapted to the external environment more or less closely according to the degree of dependency on such traits required by the bird in question.

The pleasure of viewing the beautiful colors shown by so many birds goes hand-in-hand with the intellectual enjoyment of the delicate adjustment between appearance and need, between pattern and behavior, as evidenced by a study of the coloration of their plumages.

The birds chosen to illustrate this article have been selected because of their colors and their variety. Space has made it impossible to show some of the largest brightly hued birds, and it goes without saying that the number shown could have been multiplied many times without exhausting the possible range of interesting and beautiful examples.

Upper Row (left to right): Eclectus parrot (male), Eclectus parrot (female), Cock-of-the-rock.

Lower Row (left to right): Splendid starling, Emerald cuckoo, Fairy bluebird, Nubian bee-eater.



The Aardwolf

the Hyaena That Isn't

by
Dr. Charles A. McLaughlin
Senior Curator of Mammalogy



The Los Angeles County Museum of Natural History is currently in the process of settling a pair of new residents in its Hall of Exotic Mammals. These strange appearing, fox-sized newcomers are aardwolves or *maanhaarjakkals*. Their uncommon, common names are respectively Dutch and Afrikaans in origin. The aardwolf was originally described from Cape Province, South Africa. Its distribution, however, encompasses much more territory than this, as it is found throughout most of the grasslands of southern and eastern Africa. They are not abundant anywhere in their range, but neither can they be considered rare. They are seldom seen primarily because of their nocturnal habits and shy nature.

The name "aardwolf" means earth wolf. This name was given to it because of its dog-like appearance and its utilization of underground burrows as nest sites. Usually these dens are vacated burrows of other animals, especially those of the aardvark. In spite of the high frequency with which they inhabit burrows, they are inefficient diggers. Their forelegs are thin and their foreclaws weak.

The name "*maanhaarjakkal*," which translated from Afrikaans means mane-haired jackal, was given to these docile beasts because of the erectile crest of long hair along the midline of the back. This crest is under muscular control, and is generally raised when the aardwolf is under emotional stress. When raised the crest increases the apparent size of the animal and gives it an appearance of ferocity. This is not all sham, for if too actively pressed, the aardwolf will rather effectively make use of its teeth in its own defense.

Although the aardwolf appears very dog-like, it actually represents a highly specialized offshoot of the hyaena family (*Hyaenidae*). The aardwolf, whose scientific name is ***Proteles cristatus***, is sufficiently distinct from the other hyaenas that some experts place it into its own family (*Prote-*

lidae), although most consider it merely a subfamily within the hyaena family. Its internal anatomy clearly shows its relationships with the hyaenas, but similarities can be seen by comparing its external appearance with the considerably more stockily-built striped hyaena of northern Africa and Asia. The similarity extends to general coloration and the erectile crest of hair on the back.

The most noticeable difference between the aardwolf and the other hyaenids is its delicate anatomical structure. The major adaptation of the hyaenas is toward utilization of carrion for food. As their food is dead it is not necessary for them to be particularly fleet of foot or agile, but they must possess great strength of body and jaws. Their food ranges in size from the smallest rodents to elephants and hippos. As they must frequently feed upon left-overs from a lion's or similar animal's kill, they must have powerful jaws and teeth to crush bones, and strong legs and necks to drag away large sections of the larger animals. The life of a scavenger is poor at best, even in areas of abundant wildlife such as the savannahs of Africa, so every morsel of food, including the marrow of the bones, must be utilized if the animal is to survive.

The spotted or "laughing" hyaena is one of the more familiar animals of Africa. Most of the motion pictures dealing with African wildlife have been taken upon the plains of east Africa, where this species is very abundant. Almost every scene which includes a "kill" shows at least one spotted hyaena along with several species of vultures and a few assorted jackals. Hyaenas are normally not hunters, although they do occasionally attack and kill animals. This generally takes place only under conditions of extreme hunger or when the prey animal is sick or otherwise defenseless. In some rare cases they have even attacked man. As carrion feeders, their economic value is primarily on the

plus side of the ledger. Occasionally hyaenas have posed some economic problems, as in South Africa where there are records of some brown hyaenas which had strayed in from further north and were responsible for the death of a great number of sheep.

The spotted hyaena's call is a distinctive "wa-a-rooof" or the maniacal laughter which is used when they gather at a kill. This latter call is familiar to almost everyone who attends the movies or watches TV. Almost every motion picture having a setting in any "jungle" in the world, uses the call of the spotted hyaena along with that of the Australian Kookaburra bird, to set the scene, although both these animals are residents of the plains.

The aardwolf has become a very non-hyaena. He has gone to a different type of food, which has resulted in some very interesting and striking modifications of structure and habit. The main item in the diet of the aardwolf is termites. Ants are also frequently eaten. They have become so dependent upon the grass-eating and other terrestrial termites for food that their distribution, like that of the aardvark, is determined by the distribution of these tiny colonial insects. The accompanying map shows the distribution of the aardwolf (diagonal lines) superimposed over the distribution of the other three species of hyaenids found in Africa (dots). The aardwolf is entirely absent from forests and mountains, although it is found at relatively high altitudes in the high plains grasslands.

The food habits of the aardwolf have produced some rather extreme developments of the tooth structure. Most of the mammals which live primarily upon ants and termites have reduced tooth size or complete absence. There is definitely a tendency toward tooth loss in the aardwolf. The large canine teeth have remained relatively unchanged from the hyaena condition. The jaw teeth, the molars and premolars, however, are greatly

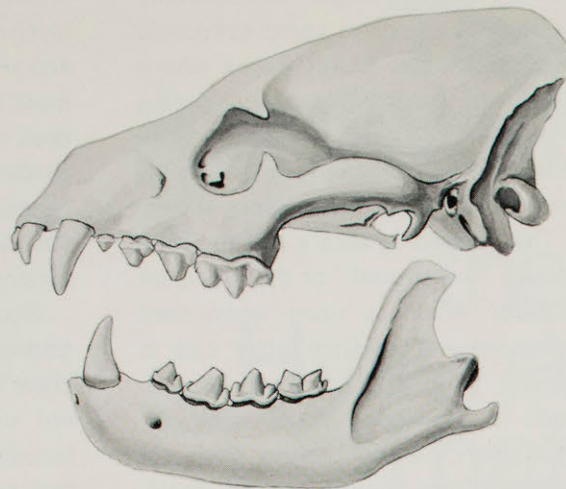
reduced in size. The upper and lower teeth do not present grinding surfaces and are not functional for chewing. As most of their food is soft-bodied and does not offer much resistance to the aardwolf's digestive juices, it is not necessary that they possess large shearing or crushing teeth like their relatives.

Recent studies being conducted by several researchers in South Africa show that the aardwolf is very dependent upon the long-nosed harvester termite for food. As mentioned above, this type of termite is a grass gatherer, rather than the more conventional type of terrestrial termite. The harvester termite is particularly valuable to the aardwolf because it comes out of its nest onto the surface of the mound while foraging for food. When the sun goes down, the worker termites literally cover the low, rounded mound as they head out into the surrounding area to cut small sections of grass which are carried back into the storerooms of the colony as food. When the aardwolf comes upon a mound of harvester termites, he can merely pick the workers off the surface and eat them without further effort.

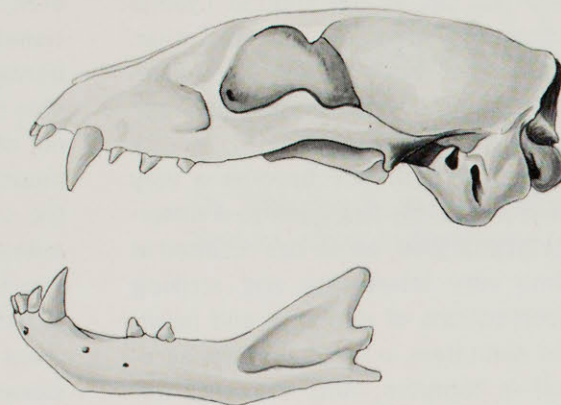
It is not nearly so easy to feed upon the many other species of termites that are so abundant in Africa. Most terrestrial termites build mounds of a mixture of earth, saliva and excreta. This material hardens in some cases to almost the strength of sandstone. It requires strength of limb and claw far beyond that of the aardwolf to break into these formidable mounds. Although the aardwolf cannot rely upon these species as a staple, they feed upon them when they find a nest broken open by an aardvark. The habitat group being constructed at the museum shows such a scene, with a pair of aardwolves feeding upon termites from an opened mound, just as dawn is breaking over the plains of northern Kenya.

In addition to the staples of the diet, termites and ants, the aardwolf

Striped Hyaena skull



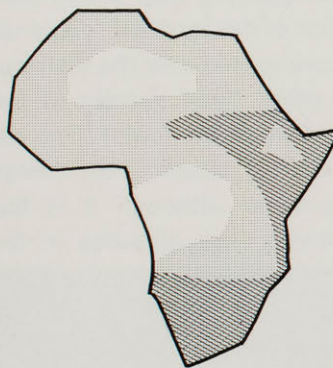
Aardwolf skull



Male Aardwolf with crest erect



Map showing distribution of Hyaena family and Aardwolf family



also eats other animal materials when accessible or required. Occasionally plant materials, such as grass, is taken, although its role in nutrition is not known. Examination of the contents of the digestive systems of aardwolves has shown the presence of many insect species, including some beetles with very hard exoskeletons.

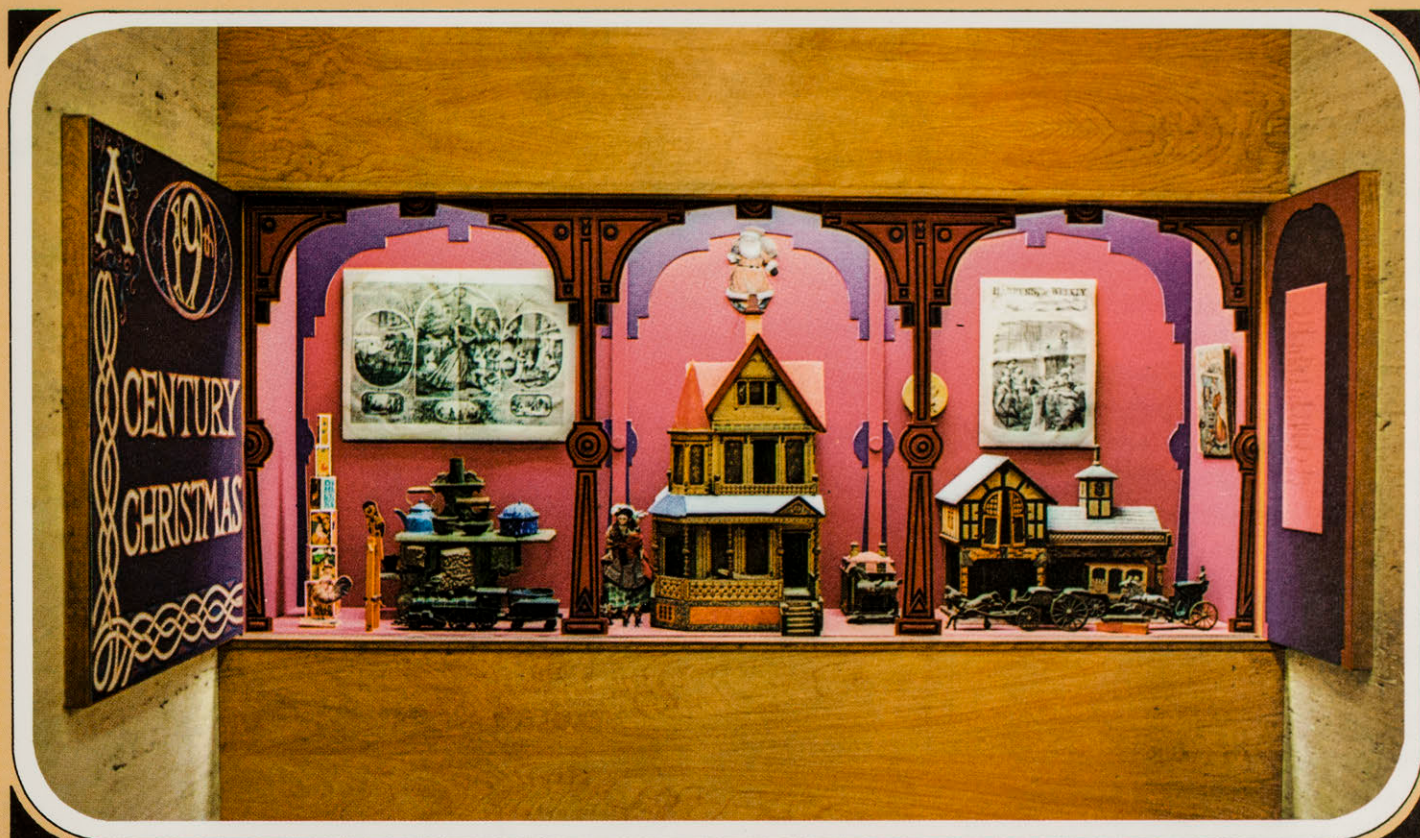
Locusts seem to be one of the more favored varieties. Less frequently the remains of small rodents, lizards, snakes, frogs, and eggs and nestlings of ground nesting birds are found. In some individuals a high percentage of carrion has been discovered. One individual examined contained the remains of a tortoise. This unusual item

of diet was a very young tortoise, which mean that its skeleton was sufficiently soft to permit the aardwolf's weak dentition to crush it.

Aardwolves are usually solitary. However, family groups consisting of as many as six individuals have been seen. The aardwolf has between two and five young, with the average number about three. The young are born in dens below the surface of the ground. In the southern parts of their range they are born between September and December. The parents both take part in the rearing of the young, staying with them until they are strong enough to fend for themselves. Even then the young frequently remain with the parents.

The aardwolf is nearly mute. Unlike other members of the hyaena family which at times can be very noisy, the aardwolf seems to emit a low, high-pitched growl or grunt only when attacked or injured. In spite of their rather minute jaw teeth, the canine teeth are large enough to be of real value in self protection and they can use them effectively when attacked by a dog or other animal. They are said to defend their dens and young with great courage. They also possess anal glands from which they exude a musky fluid when disturbed.

The museum's specimens were collected in the northern part of the aardwolf's range in the plains just south of Maralal, Northern Frontier Division, Kenya. They were taken on the 1966 Cheney East African Expedition by Dr. Kenneth E. Stager, Senior Curator of Ornithology at the Museum. These animals were flushed from beneath the bushes during the middle of the day, where they had apparently bedded down to wait for the next night's feeding. The scene being depicted in the museum's new habitat group was chosen from photographs and descriptions of the area provided by Dr. Stager. These unusual animals should prove to be an exciting addition to our already exceptional displays of the animals of Africa.



A Nineteenth Century Christmas

Prince of Peace! Alas, the shame
That the blessedness He came
Yearning to bestow on men
Still no nearer seems than then!
We it is who hinder peace;
Through us sin and pain increase:
He would give the whole world peace.

From a Christmas Carol,
Harper's New Monthly Magazine
January, 1873

While the East stairway landing case alternates between the History Division and Science Division for its changing exhibits, it has now become almost a tradition for History to have it over the Holiday season. A small case at the bottom of the stairs which give access to the basement galleries, it is especially suited for a Christmas theme and certainly much of the material which the History Division has in custody lends itself to these exhibits.

Over the years it has inspired many themes—Christmas in Early California, Santos of the Southwest, Chapels and Cherubim—and each year it had seemed to exhaust all the possibilities for further exhibits. Invariably, however, come the next September, something discovered in an unopened drawer, or seen a hundred times but noticed for the first time, will spark the imagination and set the mood for this tableau.

Its success has evolved from far more

than the material displayed. In this exhibit no attempt has ever been made to tell an historical story; historically interesting items have been used only to create a mood and evoke a spirit sympathetic to their place in time and usefulness and withal be appropriate to the season.

It is this aspect of the exhibit which has stimulated imaginative resourcefulness and is responsible for whatever successful effect has been achieved.

The December display for 1966 was certainly sparked by the discovery of a charming Victorian doll's house. With it were associated other items—toys, dolls, games, books—which either by their color or character seemed to be just right for the totality of the desired effect. Leaping over the chimney, a not too very old Santa, but charming nonetheless, recalls to mind his ancestor St. Nicholas or Sunder Klaas of the Netherlands to whom the children, hopefully waiting for some gift dropped

from the chimney-tops into outstretched aprons, sang:

"Sünder Klaas du gode Bloot!
Brenge' mi Nööt un Zuckerbrod,
Nicht to veel un nich to minn
Smiet in mine Schörten in!"

By him on the wall hangs *Harper's Weekly* where in 1863 Santa Claus first appeared in graphic form, a somewhat jolly, rotund little elf with a wreath upon his head, the creation of Thomas Nast who, after a visit to the front during the Civil War, drew Santa Claus as his effort to bring a little bit of cheer to a saddened people.

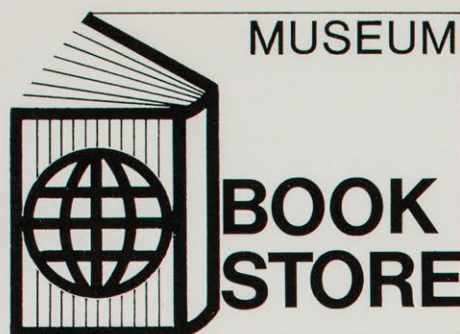
With this in mind and lest we neglect history it should be recalled that our customs have been inherited from the Old World. From Germany comes our Christmas tree, Santa Claus from Holland, the Christmas stocking from France or Belgium, while our Yule-tide greeting of "Merry Christmas and a Happy New Year" was an Old English greeting shouted to passersby.

ring is to wear it while washing dishes, for in time the stone will absorb detergent and oil from the water.

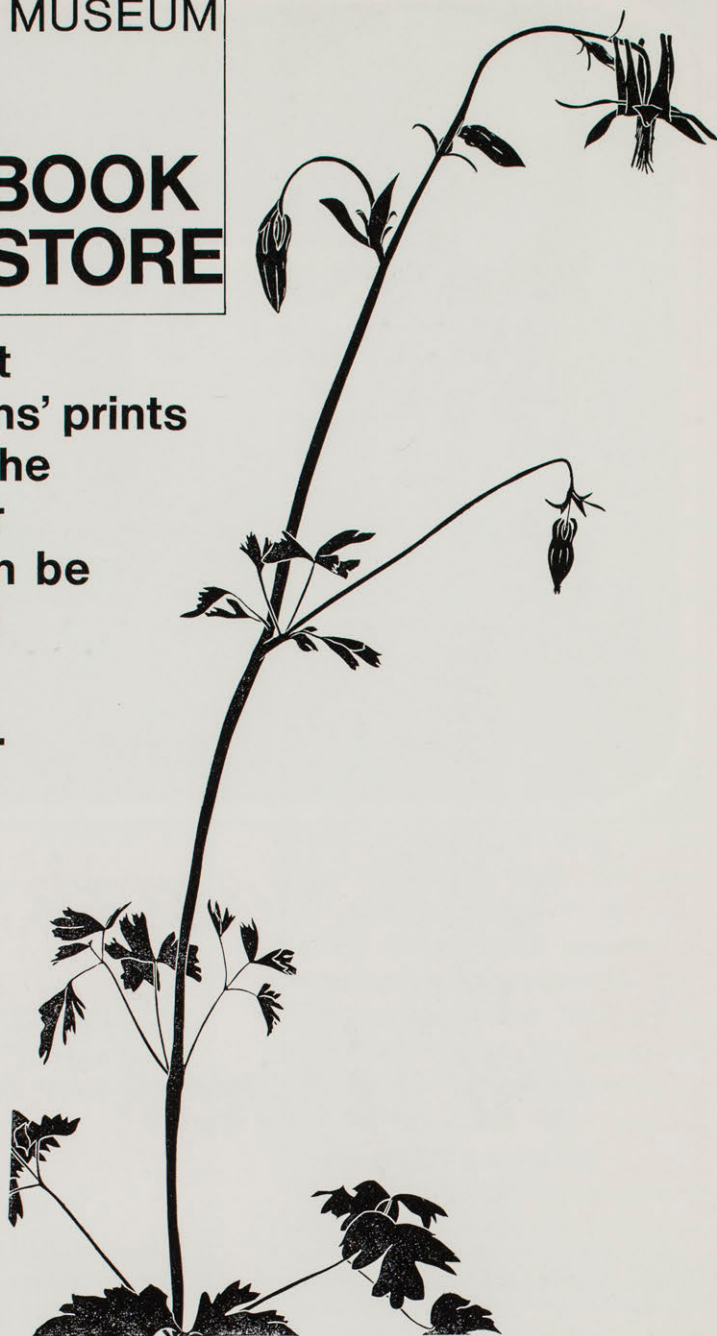
The cause of the brilliant colors of precious opal has been a subject of much scientific debate for over a century. The color of gems is due to various factors and is, therefore, often difficult to explain. In most minerals there appears to be some relation between chemical composition and color. For example, most copper minerals are green or blue. In some cases a small amount of an element such as chromium or manganese will cause a characteristic color. But in opals the wide range of colors, even in a single specimen, suggests that this explanation cannot apply. Furthermore the opals' colors are not due to simple light absorption, as in emeralds, rubies and other transparent crystalline gems; reflected, not transmitted light, brings out the opals' color.

It was once thought that precious opal is made up of laminations or thin layers of slightly differing indices of refraction. These differences, presumed to be related to variations in water content, would separate white light into its component colors by reflecting and refracting them at slightly different angles.

Recent studies made by Australians attempting to produce synthetic precious opal have suggested another explanation for the colors. Examination with an electron microscope reveals that all opal consists of an aggregate of submicroscopic spheres. In the case of common opal these are randomly arranged. However, in precious opal the spheres are arranged in a geometric pattern of lines or planes. The Australian scientists think that this structure acts like a diffraction grating, an optical device which separates light rays according to their wave length or color. The particular color seen in opal is a function of the size and spacing of the spheres and of the orientation of the rows or planes, as well as the angle of the incoming light.



**All of Artist
Henry Evans' prints
shown in the
Wildflower
Exhibit can be
purchased
at the
Bookstore.**



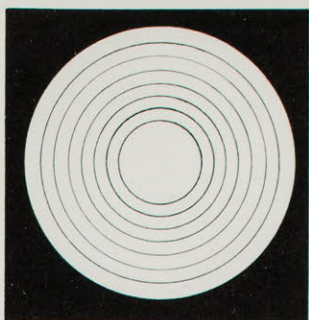
Books on Flowers and Plants

California Spring Wildflowers: Philip A. Munz	\$ 2.95
California Mountain Wildflowers: Philip A. Munz	2.95
California Desert Wildflowers: Philip A. Munz	2.95
California Flora: Philip A. Munz	11.50
Flora Mexicana: M. W. Pesman	4.00
Flowering Trees for Year-Round Color in So. California	1.00
Redwood Empire Wildflower Jewels: D. K. Young	2.95
Trees of the West	1.95
Common Edible & Useful Plants of the West: M. Sweet	1.00

Ferns & Fern Allies of California: S. J. Grillos	1.50
Native Trees of Southern California	1.95
Sea Shore Plants of So. California: E. Y. Dawson	1.75
Cacti of California: E. Y. Dawson	1.50
Native Shrubs of So. California: P. H. Raven	1.95
100 Desert Wildflowers in Natural Color: Natt N. Dodge	1.50

There are many other books on Flowers and Plants of the West.

All Alliance Members receive 20% discount. On mail orders add 4% sales tax and 10% handling charge.



MUSEUM SPOTLIGHT



Eighth Annual Exhibition of "California Wild Flowers in Art and Bloom"

A display of one hundred or more California native flowers opened at the Museum in early May and is on view each Saturday and Sunday until June 2. Visitors are seeing many new and different kinds of blossoms this year because the display is scheduled one month later in the flowering season.

In conjunction with the week-end wild flower displays, a collection of 60

botanical linocuts by Henry Evans, a well known San Francisco artist, is on view daily.

The Evans prints are exquisite renditions in both monotone and multiple colors, and possess the delicate and simple beauty of the kinds of flowers depicted. Many species of flowers are represented in the Evans collection and all reflect the very fine skill and artistic ability of the artist. (Members may acquire copies of these prints at a nominal price.)

Dr. Bonnie C. Templeton, Curator of Botany, has been presenting gallery talks on the "History and Legends of the California Wild Flowers" at 2 p.m. each Saturday and Sunday during the exhibit.

Turbine Car Gift

History is constantly in the making and in some instances we can, with a fair degree of accuracy, estimate the historical significance of an event or an object during its lifetime. When we are so fortunate it behooves us to preserve at the time as much as possible. So much or all can be lost in the days, years or centuries that follow.

In January the Museum was privileged to receive as a gift from the Chrysler Corporation one of the

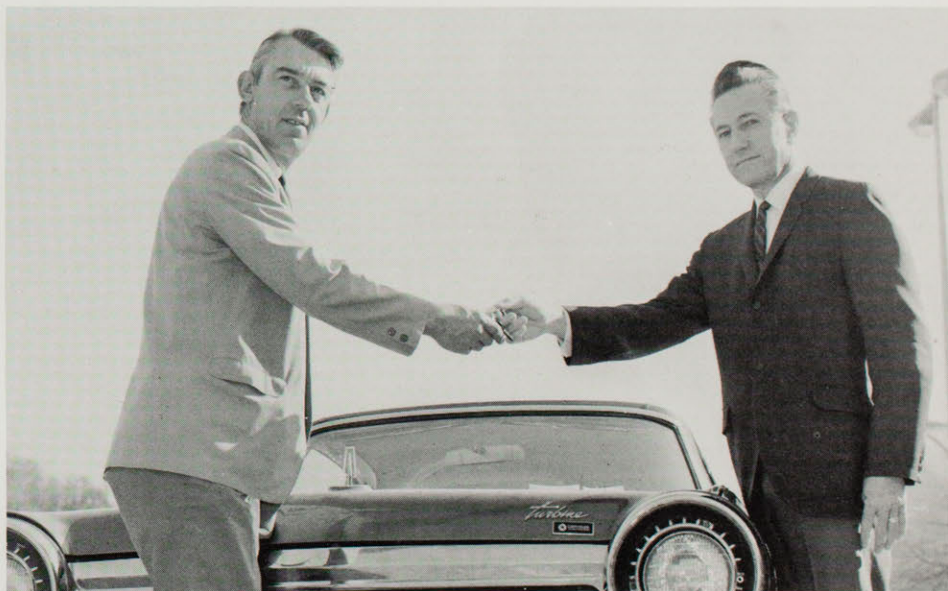
turbine cars used in their two-year consumer research test program which ended in January, 1966. It is now on exhibit along with an extra engine in the Transportation Hall.

Chrysler Corporation during the last 10 years has designed and exhaustively tested in laboratory and on the road four different experimental engines. This car represents the fourth generation. The previous three engines were installed in standard Chrysler automobiles.

Fifty limited production fourth generation turbine cars were specially designed and hand built by GHIA of Italy for the consumer research program, which began with the delivery of a car to the first selected user on October 29, 1963. Subsequently, turbines were loaned, on a rotating basis, to 203 different users in 133 cities in 48 states who drove the cars a total of over 1,000,000 miles.

At the termination of the program Chrysler decided to put eight cars back into original condition and give six of them to selected Museums across the United States. The other Museums selected are: The Smithsonian, Detroit Historical Society, Edison Institute Museum, St. Louis Museum of Transportation and Harrah's Automobile Collection.

Our car is No. 36 and was driven in Pennsylvania during the test period.



Los Angeles County Museum
Exposition Park, Los Angeles 7, California
Return Requested

Non-Profit Organization

U.S. Postage

PAID

Los Angeles, California

PERMIT NO. 13945

MRS B R FORSYTHE
1500 NO PEARL AVE
COMPTON, CALIF 90221
SH12

